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Firefighters' Multimodal Literacy Practices

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FIREFIGHTERS' MULTIMODAL LITERACY PRACTICES

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ABSTRACT

This study explores the ways that firefighters' utilize multimodal literacy practices to construct and communicate knowledge in environments where risk is present. Specifically, this dissertation sketches the interrelationships between alphabetic, aural, cognitive, gestural, kinesthetic, oral, tactile, spatial, and visual genres which evolve and circulate within embodied, analog, and digital media on firegrounds. A heuristic research methodology was constructed by borrowing and adapting components from extant multimodal and digital ethnography, community-based research, and writing activity and genre research. Using a range of emergent digital research methods, data was captured during six observational periods wherein 75 participants engaged in live-fire training activities; supplemental data was collected 16 participants who volunteered to discuss their practices during open-interviews. Data was analyzed using a framework that triangulated multimodal theory, writing, activity, and genre research, and rhetorical theory and included tools such as genre ecology mapping and rhetorical analysis. Analysis suggested that (1) firefighters leverage a wide array of literacy practices drawing from a full range of semiotic resources to construct communicative and mediational genres; (2) firefighters of different rank have access distinct genres and genre assemblages; (3) firefighters uses of multimodal genres were agentive, interpenetrated, pathos laden, and richly layered.

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CHAPTER ONE

Amidst technologies, literacies, and risks: Carving out a voice

> With the long chine, and led the mind of man / To third the labyrinthine mysteries /
> Of a dim art; the oracular face of fire / Look'd with clear eyes, that heretofore were scaled.
> (Aeschylus, 1902, p. 36)

> Language, and by extension, technology, is a force that, like fire, can be used for burning, but it can also burn those who use it.
> (Robert Johnson, 1998, p. 18)

***

It is just past midnight on February 5, 1992 in Indianapolis, Indiana. A 911 operator receives a report that there is a smell of smoke at the Indianapolis Athletic Club. Fire companies and command staff from the Indianapolis Fire Department (IFD) are dispatched to investigate. An engine company is the first to arrive on scene. They give a size-up, reporting that there is no visible sign of fire. Discovering heavy smoke, the engine company begins to search for the fire, as additional units arrive on scene. A truck company discovers the fire in a void space on the third floor. Via his portable radio, the incident commander requests additional units: the dispatcher either does not hear, or does not acknowledge this message. The incident command system that IFD regularly uses is not implemented. Crews begin to initiate a fire attack, but the engine company loses its water supply. Fire conditions deteriorate. Crews restore the water supply, but two firefighters from the engine company realize they are low on air as audible alarms on their air packs sound. They attempt to exit, but become separated amidst conditions of low visibility. They run out of air, and become unconscious. It is not apparent to firefighters and the incident commander located outside that firefighters within the building firefighters are in peril. Inside, fire conditions continue to deteriorate. Meanwhile, two other firefighters realize that a member of a truck company is running

out or has run out of air on the third floor. When they attempt to help him exit, they, too, become separated. One of them becomes disoriented and removes his glove to press an emergency button—he burns his hand. He tries to call for help on the radio. He fails or no one answers. The ceiling falls on him. His partner is trapped in a jumble of furniture. Miraculously, three of the five survive. Investigators identify a myriad of communications problems that contributed to breakdowns on the scene, including inadequate accountability of personnel, failure to implement a command management system, and unfamiliarity with new radio systems and equipment.[1]

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Introduction

Few technologies have figured so prominently within the cultural, historical, and economic development of human civilization as fire and language. While the epigraph from Aeschylus' *Prometheus Bound* frames fire as a metaphor for technology writ large, the later of the two epigraphs reveals a darker truth that these technologies share. Not only have fire and language resisted humankind's best attempts to exercise domineering control over them, but these forces have also had a destructive impact on the human civilizations who have used them—most notably, as Johnson observed, when fire and language have been wielded as weapons. Certainly, the overt use of fire as a weapon—from fire ships and napalm to Greek fire and scorched earth techniques—lends credence to perceptions of fire as the more damaging of the two, but, in actuality, language may be more harmful precisely because of the tacit assumptions which surround its practice.

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[1] This vignette is culled from the United State Fire Administration's (1992a) "Indianapolis Athletic Club Fire," an after incident investigation conducted under the auspices of the agency's Major Fires Investigation Program and Technical Reports Series.

According to Walter J. Ong (1986) the technologies through which literate activity is enacted, whether oral, chirographic, print, and/or digital, are assigned differing social value because the technology in ascendency is taken for granted, as such: "[Literacy] tends to arrogate itself supreme power by taking itself as normative for human expression and thought" (p. 19). Within contemporary Western culture, as Elizabeth Daley (2003) has remarked, "the unstated assumption is that [literacy] means the ability to read and write *text*" (p. 19). Put simply, a society's propensity for one literacy over another, is one way that collectives within that social body exercise a form of dominance that French sociologist Pierre Bourdieu referred to as *symbolic violence*:

> For the symbolic act to exert, without a visible expenditure of energy, this sort of magical efficacy, it is necessary for prior work—often invisible, and in any case forgotten or repressed—to have produced, among those who submit to the act of imposition or injunction, the dispositions necessary for them to feel they have obeyed without even posing the question of obedience. Symbolic violence is the violence which extorts submission, which is not perceived as such, based on 'collective expectations' or socially inculcated beliefs." (1998, pp. 102-103)

Indeed, the notion that language—or more precisely, that normative renderings of language practices instantiated as literacies—is endowed with both generative and destructive force has been explored within the work of Antonio Gramsci (1957; 1971), Michel Foucault (1972; 1978), and Paulo Freire (1970; 1987), among others.

Nearly two decades ago, Cynthia L. Selfe (1999) extended a Bourdieuian lens to explore the interrelationships of technology and literacy within the United States education system. Selfe posited that the two "[cultural formations] have become linked in

ways that exacerbate current educational and social inequalities...rather than addressing them productively" (p. 1166). Moreover, Selfe argued that failing to critically attend to their interrelations "sustain[s] and reproduc[es] a unfair system that...enacts social violence and ensures continuing illiteracy under the aegis of eduction" (p. 1166). Consequently, Selfe challenged scholars, teachers, and administrators within the field of rhetoric and composition "to *pay attention* to how technology is now inextricably linked to literacy and literacy education in this country" (p. 1166). This dissertation project takes Selfe's call seriously by exploring the ways that literacy matters with and for the work firefighters—an extraordinary group of blue collar, technical communicators who are vulnerable to the lasting burns that both language and fire can inflict.

Identifying as both a firefighter and scholar, I have experienced first-hand how literacy can be made to burn. I have been trained. I have been drilled. I have been instructed and indoctrinated. And, I have been chided, coaxed, and compelled to not only recognize *that* members of these communities value literacy disproportionately, but to also discern *how* members of these communities value disproportionately. At this juncture, I appreciate that literacy is valued disproportionately because it means differently with and for the work that members of these communities perform. Whereas scholars tend to place a high value on analytical thinking and print-based, alphabetic literacy, firefighters esteem physical and mechanical capabilities. Kiddingly, one of my closest firefighter friends refers to the academic work I do as "fancy book learning." Another firefighter whom I regularly instruct with is not shy to label academics, fire chiefs, politicians, and white-collar workers as "egg heads" or "paper pushers." I'm repeatedly surrounded by highly intelligent firefighters who consistently refer to

themselves as "just a dumb fireman." While these terms and sayings are proffered in jest —often as witticism, ironic critique, or repartee that I've come to perceive as an essential quality of the fireservice—they illuminate the socially and politically estranging demarcations by which literacy is associated with blue- and white-collar work in America.

Exploring working class literacy, Mike Rose (2009) asserted that "[g]eneralizations about intelligence, work, and social class deeply affect our assumptions about ourselves and each other, guiding the ways we use our minds to learn, build knowledge, solve problems, and make our way through the world" (para. 9). Like other blue-collar occupations that have developed within a Western socio-historical context, firefighting has been subjected to Taylorist management principles which instantiated the Cartesian mind/body split within occupational structures by apportioning cognitive work to managers and physical work to laborers. Indeed, the bugled collar devices that fire officers wear on their uniforms to denote rank—symbols which conjure back days of yesteryear when officers volleyed orders to firefighters through speaking trumpets—continue stand as bastions of a modular division of labor that is taken for granted within the fireservice. Such dispositions have given rise to, as Rose (2009) so eloquently asserted, a "cultural iconography [that] promotes the muscled arm, sleeve rolled tight against biceps, but no brightness behind the eye, no image that links hand and brain"(2009, para. 10).

In keeping with this cultural iconography, then, it is unsurprising that firefighters might believe their occupation has more to do with strength, than say, literacy—that they might surmise that learning how to use an axe or a chain saw proficiently is of greater

significance to their career, than say, a book, a pencil, or a computer might be. This is because firefighters work amidst a cultural iconography that buttresses the hegemony of a print-based, alphabetic literacy, while subverting the value of oral, visual, aural, gestural, kinesthetic, tactile, and spatial literacies. As Selfe (2009) put it, "the almost exclusive dominance of print literacy works against the interests of individuals whose cultures and communities have managed to maintain a value on multiple modalities of expression, multiple and hybrid ways of knowing, communicating, and establishing identity" (p. 618). Firefighters are an archetypal example of such a community, as a broad array of multimodal literacies regularly circulate on firegrounds every day and enable firefighters to carry out a range of invaluable epistemic and communicative functions such as assessing risk, navigating space, locating victims, and coordinating tasks. Still, normative cultural dispositions toward literacy—those that firmly entrenched within an alphabetic, print-based tradition—discount the ways that firefighters' reading and writing practices enact a literacy that is wholly unique to this profession, devaluing the intelligence that underlies this work.

Within rhetoric and composition, normative print-based dispositions toward literacy are so deeply rooted that scholars who have worked to disrupt its socially dividing power sometimes miss the more subtle ways that their statements might perpetuate the very silos they are working against. Consider, for instance, how problematic ideological assumptions about the interrelationship of literacy and knowledge work underlie Deborah Brandt's (2005b) "Writing for a Living: Literacy and the Knowledge Economy" and Johndan Johnson-Eilola's (2005) *Datacloud: Toward a New Theory of Online Work*.

Brandt's study, an article that examined a subset of data tied to a larger longitudinal study of U.S. literacy, focused on the ways that the emerging knowledge economy has impacted workplace literacy. Such economic shifts, Brandt hypothesized, "could stand to affect the ideological basis of literacy in broad and unforeseen ways" (p. 167). In keeping with such aims, Brandt interviewed "people employed in writing-intensive positions" which she "defined as [positions] that engage people in writing for 30% or more of the typical day" (p. 168). In other words, her study surrounded participants who worked in white-collar occupations such as an attorney, a securities dealer, an editor, an accountant, and a mortgage broker (pp. 171-172). However, Brandt's view of writing—which for the purposes of this study she defined as "a broad term, including any activities that involve alphabetic inscription" (p. 168)—also imposed unnecessary constrictions on the study by exclusively privileging a print based view of alphabetic literacy. As a result, participants pointed out that they regularly composed genres such as proposals, prospectus, training materials, reports, letters, emails that almost exclusively made use of alphabetic, print based literacies (pp. 171-172).

In comparison, Johnson-Eilola's (2005) study of ubiquitous computing accommodated a considerably broader view of writing than Brandt's, as he took stock of how a range of multimodal literacies involving visual, aural, and alphabetic components coincided with digital activities such as video gaming, web design, and instant messaging, for example. That is to say, Johnson-Eilola understood that computing had already had precipitated "important and ongoing shifts in the way we work, communicate, and live," especially with respect to the range of multimodal literacies necessary for participating in these activities (p. 4). Still, in considering how such shifts

related to emerging "symbolic-analytic work," Johnson-Eilola exclusively listed white collar professionals such as "architects, systems analysts, investment bankers, research scientists, and management consultants" (pp. 18-19). Noticeably absent from both studies are blue-collar workers, which appears to suggest that a common assumption underlying each study is that *knowledge work/symbolic analytic work* is white-collar labor carried out using print and/or digital literacies. This view of literacy is problematic because it not only neglects to consider how blue-collars contribute to the production of knowledge, but also discounts the distinct reading and writing practices that blue-collar workers have constructed to carry out epistemic and communicative labor unique to their professions. Brandt's article, then, is even more problematic because it seems to suggest (1) that "writing intensive positions" are restricted to those who compose using print and alphabetic literacy, (2) that "writing-intensive positions" are white-collar positions, (3) that work in the knowledge economy *is* white-collar work, and (4) that blue-collar work *is not* "writing intensive" work.

This study, *Firefighters' Multimodal Literacy Practices*, responds to the limitations in these approaches by exploring the ways that literacy matters with and for the work of firefighters—an extraordinary group of technical communicators. Following Paulo Freire (1987), I work from the premise that "scientifically, all languages are valid, systematic, rule-governed systems" (p. 35). In contrast to dominant social dispositions which place a higher value on print-based literacies, I consider the full range of semiotic modes vital to the construction and communication of knowledge. Certainly, print-based literacy occupies an important role within the fireservice, but on emergency scenes print-based literacy tends to operate within the background of a broader spectrum of

multimodal practices: it is not *the* mode, but *one of many modes* that *s*upport and facilitate communication and knowledge production within the fireservice. More specifically, this dissertation seeks to better understand the kinesthetic, tactile, visual, oral, aural, alphabetic, and gestural practices that firefighters marshal to realize epistemic and communicative aims through pursing two interrelated research questions:

- How do firefighters use multimodal literacy practices to construct and communicate knowledge in environments where risk is present?
- How do knowledge/multimodal messages circulate and transform within the time/space of a fireground?

In other words, this study seeks to illuminate how multimodal literacies support the work that firefighters perform as producers, consumers, and communicators of knowledge. As such they target data related to (1) how firefighters "read and write" on firegrounds, (2) how firefighters marshal a variety of modalities to construct multimodal literacy practices, and (3) how the dynamic exigencies firefighters confront relate to, and have impacts for, the ways they might construct and/or communicate knowledge in practice. One significant delimitation of this dissertation, is that it primarily focuses on the multimodal literacy practices firefighters perform on firegrounds, which differ from those they might utilize at motor vehicle accidents, hazardous material responses, or natural disasters. Turning to the larger task of addressing those questions, then, this chapter outlines the exigency which motivates this study, before situating this study within existing literature from the fields of rhetoric and composition, computers and writing, and technical and professional communication that deals with literacy, multimodality, and/or risk—concepts that figure prominently within this dissertation project.

Everyone goes home: Firefighter fatality within the U.S.

As a firefighter, rhetorical theorist, literacy scholar, and writing teacher, I would argue that social dispositions toward literacy are consequential to the work firefighters perform. As outlined above, scholars such as Selfe (1999; 2009), Rose (1989; 2009), Gramsci (1957; 1971), and Freire (1970; 1984), have argued that tacit assumptions surrounding literacy perpetuate a dominant form of symbolic-violence that contributes to social and economic inequity. In and of itself, this is a significant consequence of literacy, but for firefighters, technical communicators whose lives depend on their ability to leverage a range of multimodal practices to read and write, neglecting their workplace literacies could have fatal consequences. If firefighters are taught that their ways of reading and writing simply do not count as literacies—and, I believe that normative social dispositions toward literacy do, in fact, teach this—then it should not be surprising when firefighters begin to perceive literacy as something that is tangential to or unassociated with their work. In fact, I believe normative conceptions surrounding literacy are a contributing factor in firefighters' line of duty deaths (LODD) in America.

According to longitudinal data that the United States Fire Administration (USFA) has gathered over the past thirty years, approximately one-hundred firefighters die in the line of duty deaths (LODD) each year (2014, para. 1). To be sure, it appears that no issue has been of greater significance to the fire service during this period than firefighter health and safety, as this grave figure has precipitated a wave of technological, legislative, regulatory, educational, and strategic reform directed toward reducing the frequency of LODD. Manufacturers developed equipment and tools with added safety features and increased protective capacities. Government agencies enacted legislation that

standardized building construction and life safety code, measures designed to mitigate the prevalence and capacity of fires. Federal, state, and private organizations increased mandates for firefighter training and education. Chemists, physicists, and fire-protection engineers made scientific breakthroughs that helped firefighters to better understand how fires develop, behave, and spread through structures. Yet, close to four decades worth of technological, legislative, regulatory, educational, and strategic reform have not engendered meaningful reductions in the rate of firefighter fatality. Without question, firefighters work in environments that are inherently dangerous, but the unwavering consistency of this statistic suggests that something else is amiss.

In order to better understand LODD within the U.S., I examined the way it emerged as a rhetorically constructed concept. In 1977, LODD reporting began as a segment of a larger fire reporting system called NFIRS that the USFA created in response to the Federal Fire Prevention and Control Act of 1974 (USFA, 1997; 2013a).[2] To report a firefighter fatality, fire departments participating in NFIRS had to complete a "Fire Service Casualty Form" (USFA, n.d.a; n.d.b).[3] However, there is one major methodological limitation related to the form: the document offers a limited set of codes for completing the box for cause of death, and thus categorizing, LODD. That is to say, those completing the form must make use of one of nine codes offered in *NFPA 901: Uniform Coding for Fire Protection* (1981) to classify LODDs by a single fatal "mechanism of injury" (USFA, 2008, p. 13; n.d.a). However, closer inspection of raw

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[2] National Fire Incident Reporting System (NFIRS) is a national database and reporting system for the U.S. fireservice that the USFA administers and maintains.

[3] Prior to 2006 fire departments completed a "Fire Service Casualty Form" or NFIRS-3; in 2006, the "Fire Service Casualty Form" became NFIRS-5.

data USFA gathered between 2000-2011, indicates that in practice thirteen categories have been proffered to account for cause of death in LODD:

- overexertion/stress
- exposure
- fall
- assault
- caught or trapped
- lost
- struck by
- collapse
- out of air
- vehicle collision
- other
- unknown
- [blank]

(USFA, 2012).

Such categories reify LODD because they emphasize factors that are temporally proximal to the moment of death such as running out of air or being trapped in a collapse, while deflecting attention from precipitating factors that are temporally distal such as communication breakdowns that can lead to a fatal situations on emergency scenes. This is neither to say that categories such as cardiac arrest—the leading cause of death in LODD in 2012—are not legitimate categories by which LODD should be understood, nor to suggest that issues related to categories such as heart health should not be considered important issues within the fireservice. Rather, it is my hope to illustrate that the categories are problematic to the extent that cardiac emergency, for example, might be considered a consequence, and not the underlying cause, of at least some LODDs. As the the vignette which opened this chapter illuminated, communications breakdowns can lead to death, despite not being the *cause of death* cited by medical examiners and investigators.

These statistics are even more problematic because they appear in annual and other periodic analyses on LODD that the USFA disseminates. For example, *Firefighter Fatalities in the United States in 2012* does not link communication to LODD even once (USFA, 2013b). In fact, these categories are so prevalent that the NFPA—an independent

organization that gathers LODD data separately and performs its own analyses—pointed to communications as a minor, complicating factor in the death of a single wildland firefighter in its own annual report on LODD (NFPA, 2013, p. 28). From a rhetorical perspective, the types of statistical reporting which both the USFA's and NFPA's draw from to construct annual and longitudinal analyses of LODD have neglected to consider the ways that firefighter fatality connects to work that firefighters perform as knowledge makers and communicators. These reports simply do not have metrics capable of tracking how a host of literacy practices that firefighters regularly utilize on firegrounds such as (1) reading and interpreting smoke, fire development, and fire growth, (2) navigating in reduced visibility, (3) interpreting the integrity of a structure, (4) having familiarity with and access to genres and genre conventions (e.g., orders, mayday, size-up), (5) understanding of, or access to, standard operating guidelines, (6) perceiving cues that suggest imminent danger (e.g., backdraft, collapse, flashover) might connect to LODD.

While all firefighter fatalities are distressing, especially tragic is the way with which this system—a system designed to anticipate and respond to the very root causes of firefighter fatality—has failed to account for the way fireground communications, if not fireground literacies, relate to firefighter fatality. This is unacceptable because these reports drive decision making processes within the fire service regarding what types of research gets funded, what types of training programs are created, what types of new safety regulations get enacted, and what types of technologies manufacturers develop. Curiously, while the set of data associated with NFIRS LODD reporting suggests that literacy and communications are unrelated to firefighter fatality, other qualitative

after incident investigation reports suggest others. For instance, in-depth investigations undertaken within the auspices of the USFA's Major Fires Investigation Program and NIOSH's congressionally mandated Firefighter Fatality Investigation and Prevention Program (FFFIPP) regularly identify issues consanguineous with literacy and communication in firefighter fatalities (see for example, USFA,1992a; 1992b; 1999; NIOSH, 2004; 2013a; 2013b).

Still, is important to note that while these investigatory reports regularly identify "inadequate fireground communication...as a contributing factor in many incidents" involving LODD firefighter communications and/or literacies have received sparse empirical attention (USFA, 1999). Case in point, aside from the USFA's (1999) "Special Report: Improving Firefighter Communications" little formal research exists on fireground communications. As the USFA asserted in this report, "[t]here is a dearth of available literature pertaining to the impact of human fact[ors] on effective fireground communication" (1999, p. 2). Further, it propounded that "[t]he number of 'near miss' incidents where fireground communication was ineffective may be higher than generally realized" (USFA, 1999, p. 2).Yet, what is most interesting is that this study pointed directly to the way in which normative dispositions toward literacy might impact firefighter education and training: "while fire departments devote substantial time to manipulative skill training, relative little training is provided to help firefighters develop stress-tempered communication skills" (USFA, 1999, p.2). That is to say, this report launched a parry squarely against firefighter education and training programs that have failed to recognize the ways in which literacy, knowledge work, and communication figure with and for the everyday work that these risk workers conduct. Again, in the

words of Rose (2009), this report pointed directly to a consequence associated with a "cultural iconography [that] promotes the muscled arm, sleeve rolled tight against biceps, but no brightness behind the eye, no image that links hand and brain" (para. 10).

Recognizing this exigency Firefighters' Multimodal Literacy Practices responds to a gap in research that exists in the academy, but is situated within an ongoing conversation regarding the intersections of literacy, multimodality, and risk that constellates the fields of rhetoric and composition, technical and professional communication, and computers and writing. As a firefighter I believe that these fields could learn a great deal from the ways in which firefighters practice and understand literacies; conversely, as a scholar who has researcher and teaching interests in these fields, I believe that the fireservice could learn a great deal from the rich and complex ways that scholars have theorized and studied literacies. I now turn toward situating this study within that conversation, before offering a brief description of the chapters that follow.

Multimodality & Literacy

Aside from the contributions this study could make outside of the academy, this study also responds to an ongoing conversation that is taking place across the fields of rhetoric and composition, computers and writing, and technical and professional communication regarding the intersections of literacy, multimodality, and risk.

Nearly two decades ago, the New London Group (NLG)—a group of scholars working across the fields of sociolinguists, semiotics, critical discourse analysis, and literacy studies—extended inquiry into the unique ways that communities enact meaning making practices based on contextually specific exigencies (Cope and Kalantzis, 2000;

Gee, 1996; Kress and Van Leeuwen, 2001; New London Group, 1996). Multimodality, as members of the NLG posited, "engages with the multiplicity of communications channels and media" and "the increasing salience of cultural and linguistic diversity" (Cope and Kalantzis, 2000, p. 5). That is to say, the NLG framed literacies as rich tapestries of interwoven social practices which make use of bodies, technologies, and material resources to create and share meaning through a variety of modal forms. As a holistic theory which was sensitive to the ways that meaning was constructed and communicated in oral, aural, gestural, visual, tactile, and kinesthetic modalities, multimodality challenged the primacy of deep seated "alphabetic-only" notions of literacy that were widely held at the time (Selfe, 2009, p. 616).

However, from a historical perspective, the discipline of rhetoric and composition has framed literacy in ways that accounted for two alphabetic modes through which humans construct and communicate knowledge. That is to say, literacy has largely meant speaking and listening through orality (an embodied, aural, alphabetic modality) reading and writing through print (a visual, textual, alphabetic modality), or some combination of the two (Elbow, 1986; McCorkle, 2005; Ong, 1982; Plato, c.a. 370; Tannen, 1982). This began to change, of course, as the field reenvisioned "literacy as an ideological arena and composing as a cultural activity by which writers position and reposition themselves in relation to their own and others' subjectivities, discourses, practices, and institutions" (Trimbur, 1994, p. 109). Scholars like Shirley Brice Heath (1983), Anne Ruggles Gere (1994), Glynda Hull (1993; 1997), for example, ventured out from composition classroom to research the ways literacies were enacted in communities, kitchens, and workplaces. These scholars had realized, as Ruggles Gere affirmed, "the

need to uncouple composition and schooling, to consider the situatedness of composition practices, to focus on the experiences of writers not always visible to us inside the walls of the academy" (1994, p. 80).

As scholars within the field took readily to this task, they discovered composers and ways of composing that began to unsettle what scholars had previously thought literacy meant. In his study of the ways that architects compose space, Peter Medway (1996) argued that "[p]art of the meaning of a text lies in its expressed relationship to other texts, whether written, spoken, or expressed in other symbolic media; context is textual as well as social, physical, and psychological" (p. 476). Richard Marback (1996) examined how a gesture, the "closed fist" of the Black Power movement, stood as a symbolical disavowal only of "a particular kind of rhetoric...a certain conception of literacy, of facility with consuming and producing written texts" (p. 186). That is to say, scholars became increasingly attentive to the ways that (multimodal) literacies connected to, and grew from, distinct geographic, cultural, and economic locations. In an introduction to his and Sharon Crowley's *Rhetorical Bodies* (1999), Jack Selzer framed the collection as "a meditation on the material aspects and groundings of language as rhetorical action as it is traditionally conceived, and on the rhetorical nature of material realities, whether or not they are literate realities or not" (p. 9). In many ways, the collection marked a pivotal moment in rhetoric and composition, as scholars explored a *material rhetoric* in this collection that not only acknowledged, but celebrated the plurality with which humans read and write.

Furthermore, as in scholars rhetoric and composition realized the "extra-textual" (Reynolds, 1989) and "extra-curricular" (Ruggles Gere, 1984) features of

reading and writing, its members embarked on a critique of alphabetic, print-literacy's primacy within the tradition that continues today. So pervasive was an alphabetic, print-based literacy, Lester Faigley asserted, that it provided the basis by which Western society had conceitedly declared an exceptionalism:

> According to the grand narrative, not only the rise of science but also the development of democracy, the celebration of the individual, the establishment of Protestantism, the codification of law, the spread of capitalism resulted from a shift from a oral basis to a written basis for conveying information and ideas. This shift is claimed to have facilitated abstract thinking and deductive logic. (1999, p 176).

Certainly, the presumptuous superiority of a Western rationalism and its *version* of a print-based literacy, as indigenous rhetoricians within rhetoric and composition asserted, had supported colonialist aspirations that contributed to the cultural and geographic displacement of Native peoples' rhetorics and literacies, but—as these scholars made clear—Native people were certainly writing (Lyons, 2000; Powell, 2002).

Indeed, pointing to the "the many tribal newspapers...[such as] the billingual *Cherokee Phoenix* of the 1820s," Scott Richard Lyons (2000) chided George Kennedy's (1998) blatant disregard for the way in which Native peoples employed print-based writing practices amidst a range of literacy practices that made use of oral, visual, and aural modalities: "...Kennedy [probably] didn't acknowledge the overwhelming proliferation of *writing* by Native people during that century...[because of] the deeply ingrained stereotypes of Indians as essentially oral creatures" (p. 459). Building on Lyons' arguments, Malea Powell (2002) told of the ways that Sarah Winnemucca

Hopkins and Charles Alexander Eastman shifted between print-based reading and writing and orality as a tactic of "survivance" to rearticulate their positionality within and amidst cross-cultural discourses (p. 428). Still further, Angela Haas (2005) examined how members of the Cherokee Nation drew on digital literacies as a way of constructing a "rhetorical sovereignty" that "serve[d] to preserve [its] culture, languages, memories, and histories" ("Recommendations," para. 1.).[4] In short, while "multimodality" had yet to emerge within rhetoric and composition as a way of naming the assortments of semiotic materials which arose in manifold forms from distinct locations, clearly scholars across the field were immersed within a conversation that attended to the mulitmodal dimensions of literacy.

By the time the brand of "multimodality" theorized by members of the NLG such as Kress and Van Leeuwan appeared within rhetoric and composition—largely by way of the field of computers and composition which sought to understand emergent forms of digital composing—the field had already firmly established its own consideration of the concept. Tracing the emergence of this term, Claire Lauer (2009) listed the work of Selfe (2007), Gail E. Hawisher and Selfe (2005), and Daniel Anderson, Anthony Atkins, Cheryl Ball, and Krista Homicz Millar (2006) among it earliest proponents. Since that time scholars have meticulously explored the ways in which knowledge is constructed and disseminated vis-a-vis *visual modes* such as text, symbol, alphabet, color, picture, video, and animation (e.g., Blair, 2012; Brooks, 2009, George, 2002; Hocks, 2003; Hocks and Kenrick, 2003; Odell and Katz, 2009; Olson, 2007; Rice and Ball, 2006; Wysocki, 2001), *aural modes* such as orality, voice, sound, music, and rhythm (e.g., Ball and Hawk,

[4] See also the more recent work of Ellen Cushman (2011), who described the ways in which applying a Western alphabetic lens to the Cherokee syllabary restrains its meaning potential.

2006; Halbritter, 2006; McKee, 2006; Rice, 2006; Royster, 1996; Selfe, 2009; Yancey, 1994), *kinesthetic modes* such as sign, gesture, body language, and dance: (e.g., Austin, 1806; Byrson, Holly, & Moxey, 1994; Hass and Witte, 2001; Newman, 2009; Roses-Thema,2008; Sauer, 1994; 2003; 2011), and, *tactile modes* such as touch, feel, and haptic feedback (e.g., Heller, Kennedy, & Joyner, 1995; Selzer and Crowley, 1999; Walters, 2010). Yet, as Selfe (2009) has continued to maintain, the hegemonic legacy alphabetic, print-based literacy within the field has been difficult to unseat.

As far as rhetoric and composition can be said to be in a transitional paradigmatic shift (Kuhn, 1962) away from an alphabetic, print-based conception of literacy to a multimodal version of literacy, it has a way to go before it realizes the full theoretical potential of multimodality. This is largely due to the way scholars work simultaneously in different directions in order to (1) discover how literacies evolve as new media emerges, (2) recover literacies that have been lost, displaced, exterminated, or forgotten, and (3) uncover complicated relationships between literacies—including complicated hybrids that have materialized as humans have interrelated materials, modalities, media, and meanings betwixt and between densely sedimented cultural and historical locales. For instance, there are studies that tend to emphasize focus on a specific modality in order to explore how it alters normative (print-based) conceptions of composing, literacy and rhetoric; there are studies that claimed a multimodal approach, but actually offered more of a bi- or tri-modal account of how literacies are enacted (Rice, 2006; McKee, 2006; Hocks, 2003); there are studies that focused on specific tools or media (e.g., Maranto & Barton, 2009; Dubisar & Palmeri; Jackson & Wallin, 2009); and, especially as of late, there has been increasing attention to the ways literacy is enacted at a broader, systematic

or ecological level (e.g., Fleckenstein, et al, 2008; Fleckenstein, 2003; Selfe, 2009; Spinuzzi, 2003; 2008; Swarts & Kim, 2009; Potts, 2009; Prior et al 2007, Prior & Shipka, 2003; Shipka, 2009; 2011).

Multimodality and cultural historical activity theory

While each of these scholars have influenced the way I think about multimodality, this dissertation tracks most closely with the work of Paul Prior et al. (2007), Paul Prior and Jody Shipka (2003), and Jody Shipka (2009; 2011). Their work, which places multimodal theory in tension with cultural historical activity theory (CHAT), complicates the theoretical tradition associated with each. Specifically, these scholars have demonstrated that marrying the two approaches offers a view of literate activity that attends with finer levels of sophistication to the ways in which strands of literacies are woven together as aggregates of practice, meaning, and material in specific locations. These scholars have sketched a distinct methodological approach that is sensitive the ways that humans are constellated by, and situated within, a range of material and cognitive substances—including, a full spectrum of media and their attendant modes—pursue and realize communicative and mediational work in the world.

CHAT, which like multimodality has a complicated and robust theoretical lineage of its own, originated from the early work of Russian psychologists Lev Vygotsky (1934/1986; 1978). It was truly sketched out as a working theory by Alexander Luria (1976; 1979), and Alexei Leont'ev (1978; 1981). Thereafter, Yrgö Engström (1987; 1999) and scholars in human computer interaction (Bodker, 1989; Nardi, 1996; Kappetllin & Nardi, 2006) expanded this approach considerably. Russell (1995) noted that CHAT was first introduced to literacy scholars in the United States by Sylvia Scribner and Michael

Cole (p. 53). Scribner and Cole (1981) valued it because it acknowledged "that there are differing types of literacy with differing cognitive consequences," an approach which deviated from a monolithic conceptions of literacy which held ascendancy at the time (Wertsch, 1985, p. 57). Thereafter, David Russell (1995) brought this theoretical tradition to the field of rhetoric and composition arguing that CHAT offered a fruitful way of exploring the interstices of genre, learning, and discursive evolutions literacy undergoes through rhetorical action:

> [O]ne acquires the genres (typified semiotic means) used by some activity field as one interacts with people involved in the activity field and the material objects and signs those people use (including those marks on a surface we call writing). [...] Literacy is always and everywhere bound up with the activity systems it changes through its mediation of behavior—and that change it. (1995, p. 56)

By positioning literacies and genres as primary components within *activity systems*, Russell drew attention to the rhetorical work that literacies and genres perform as agents of discursive change within such systems. Moreover, Russell drew an important distinction regarding literacies, arguing that they were essentially multimodal character in nature: "[m]ediational means (tools) may consist not only of tools in the usual sense (hammers, computers) but also semiotic tools: speaking and writing, as well as gestures, music, architectures, physical position, naturally occurring objects, and so on" (1995, p. 54).

Still, while Russell theorized that a CHAT framework understands literacies as essentially multimodal—aside from the work of Prior et al. (2007), Prior and Shipka (2003), and Shipka (2009; 2011)—to date applications of the framework within rhetoric

and composition have tended to embrace a more alphabetic, albeit digital, version of literacy[5] (Russell, 1995; 1997; Russell, 2009; Bazerman & Russell, 2003; Palmquist, Kiefer, and Salahub, 2009; McNely, 2009; Slattery, 2005; Spinuzzi, 2003; 2004; 2008; 2010; 2011). For instance, whereas McNely (2009) examined the way digital literacies associated with microblogging are used to perform backchannel communication at conferences, Spinuzzi (2003) took up the framework to trace the oral, visual, written, and digital genres that surrounded a traffic database in Iowa. Or, consider the account of literacy Slattery (2005) offered in his description of the genres that writers at a technical documentation firm interacted with:

> The writers at DSU create technical documentation for client companies, primarily weaving new documents out of past versions of the documentation, e-mails from developers, notes taken at meetings, and numerous other sources. Furthermore, work delegation and project coordination is managed through e-mail, instant messaging, and a series of drafts and revisions (usually between two and four) for each documentation project. These texts are scattered throughout physical and virtual space, stored in the client company's internal document management systems, the DSU's own server space, and the writer's hard drive in addition to e-mail folders, instant-message exchanges, and handwritten notes on drafts and sticky notes. (p. 315)

While Slattery certainly identified that DSU's technical writers utilized a robust collection of digital and print based genres, the collection which consists of emails, sticky

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[5] Recently, Russell (2009) called the body of scholarship which has brought rhetorical genre studies (RGS) in conversation with cultural historical activity theory (CHAT) writing, activity, and genre research (WAGR).

notes, instant messaging, and handwritten notes is an exclusively alphabetic account of literacy. What I find most interesting in Slattery's use of the phrase "numerous other sources" is that he seemed to signal, but does not meaningfully account for a broader, set of multimodal genres, literacies, and practices. Consequently, the work of Prior et al. (2007), Prior and Shipka (2003), and Shipka (2009; 2011) might be seen as a distinct subset of what Russell (2009) called writing, activity, and genre research (WAGR) because it has accounted for multimodality in a much richer way.

I find Prior et al, Prior, and Shipka's approaches useful for two reasons. First, as a theoretical framework CHAT/WAGR offers a descriptive lens for sketching the ways humans purposefully leverage cognitive and material matter. It is particularly useful for taking stock of literate activity. The basic nodes within an activity system (subject, tools, object/ives[6]) correspond in many ways to those associated with the rhetorical situation (author, message, audience/aim). Second, by accounting for multimodality within a WAGR framework, Prior and Shipka have successfully demonstrated that there are non-alphabetic genres (e.g., tactile, kinesthetic, aural, visual, gestural, spatio-temporal) that are important to the ways in which literacies are enacted within broader activities. That is, by adding multimodality to WAGR Prior and Shipka have pushed this framework in ways that extend the descriptive and analytical capacity of this framework. To demonstrate why I find Prior and Shipka's approach slightly more robust, let's apply these frameworks to the popular murder mystery board game of Clue as a way of clarifying how each understands literacy slightly differently.

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[6] Object/ive is a representation of Russell (1995) who represented the distinction between the material (object) toward which mediational activity is directed and the aim (objective) of that activity as object(ive) (p. 57).

First, we'll use CHAT as a way of outlining the variables that are important to a literate act. CHAT calls attention to the interrelationships between the candlestick (the tool/message), Colonel Mustard (the subject/author), the library (the activity system/ context), Professor Plum (object/audience), and the crime (objective/aim). What CHAT does well is direct attention to the ways that specific nodes interrelate (e.g., Colonel Mustard/candlestick; Colonel Mustard/Crime; library/candlestick). As Kenneth Burke outlined in *The Grammar of Motives*, by paying attention to the ratios between these variables we might draw attention to, or deflect attention away from, the relationships of those nodes to one another, and we might do so with different layers of sophistication. That is, by focusing on the tool and the object, for instance, I might discover a candlestick been used to kill Professor Plum, and I might go so far as to posit that *candlesticks kill people*. However, I might, conversely, focus on the relationship of the subject and the tool and discover that Colonel Mustard owned a candlestick. Thereafter, I might combine the two pieces of information to hypothesize that Colonel Mustard's candle killed Professor Plum. Did it fall? Was it a self inflicted blow? Did Miss Scarlet accidentally tip the candle which was precariously leaning to begin with? We may never know. The combinations, are, well, numerous. But what is most important to take away from this is that if we don't fully account for the interrelationships we might ultimately come to advance shortsighted generalizations of an activity such as *all Colonel Mustards are killers* or that *all candlesticks kill Professor Plums*, instead of articulating a more robust statements like *Colonel Mustard wanted to steal the vast riches Professor Plum had accumulated from publishing in academic journals, so lo and behold, when their paths intersected in a precise moment in time and space in the library, a candlestick*

miraculously appeared in his hand, which the Colonel (already a homicidal maniac thus his title) then used to strike the dude.

Bringing modality in to this account, let's now see how these different approaches understand the game slightly differently. Let's say there are different types of candlesticks: those that have can only fit one candle and those that can fit many. And, let's say that the single-candled candlestick is a representation of alphabetic modalities; in contrast, a candlestick that holds two or more candles might consist of some combination of alphanumeric, kinesthetic, visual, aural, oral, tactile, spatio-temporal, architectural, and/or olfactory modalities. (Note that semiotics accounts of modality tended to be concerned with how shiny the candlestick might be, what type of metal it is made of, and how that shininess relates to the molecularity of the metal itself, and less concerned with how candlesticks relate to the game.) In contrast, rhetoric and composition cares about the game, but historically, it has predominantly focused on the importance of the single-candled candlesticks within the game. As it has turned toward a multimodal understanding of literacy, it has begun to account for bi-, tri-, quad-, and multi-candled candlesticks within the game. Still, while studies in rhetoric and composition taking multimodality into consideration account for the range of possible candlesticks and parts of the game, these studies haven't been as meticulous in accounting for the relationships to between separate nodes. We have rich accounts of Colonel Mustards with tri-candled candlesticks in libraries, or Professor Plums using bi-handled candlesticks on YouTube, but these accounts still have a ways to go before they are capable of fully tracing the ways that an array of candlesticks mean differently for different subjects in the game.

Of course, it's a complicated and laborious task. Especially in that literacy is now enacted within, and across, *embodied* (oral, aural, visual,tactile, kinesthetic, cognitive, spatial), *analog* (print = visual [image + alphanumeric + color] + tactile), and *digital* worlds (e.g., visual, oral, aural, haptic, animation, alphanumeric, cognitive, spatial). And that's what WAGR has done such a great job of illustrating! WAGR demonstrated that we might use CHAT as a way of accounting for how specific nodes within the game interrelate as it is played across embodied, analog, and digital environments. The limitation in extant WAGR research is, however, that it has more or less been concerned with the ways that different types of single-candled candlesticks intersect as the game is played (e.g., embodied/conversation; analog/social security card; digital/emails). And that is why Prior et al. (2007), Prior and Shipka (2003), and Shipka's (2009; 2011) contributions are so valuable: they have shown that we can use the CHAT framework, but also begin to account more deeply for the ways that multi-candled candlesticks mean for it, too! That is, we might combine WAGR with multimodality to gain level of critical perspective to issues of scope, positionality, and difference that, in many approaches to literacy (and, composing, too) are simply absent. They ask, "can we keep the camera on the ball *and* the game" (Spinuzzi, Hart Davidson, and Zachry, 2006, p. 44). As rhetoric and composition continues to dig down into these interrelationship, it's important not to lose sight of the long view, too. We might consider multimodality as something constrained to the candlestick, accounting for the molecularity of its steel and that relationship to the shininess of that candlestick, as semiotics tends to do; or, we might attend with greater sophistication to the ways that shiny candlesticks can be oriented by Colonel Mustards in libraries that have disastrous consequences for our Professor Plums.

Multimodality, literacy, and risk

While this dissertation is very much concerned with multimodality, I have taken up this concern only because I see multimodality as a central issue to the way in which risk is rhetorically constructed, communicated, and apprehended at a social level. As I outlined earlier and argue hereafter, firefighters are technical communicators and knowledge workers who utilize literacies in ways that productively complicate existing accounts of multimodality within rhetoric and composition. Ultimately, I not only suspect that many of the ways that firefighters practice literacy are unacknowledged and poorly understood, I also suspect that their ways of making and communicating knowledge are silenced by both the organizations and publics whom they serve. It is my hope that this dissertation is most about how firefighters might enrich our understandings of how multimodality, literacy, and risk interrelate. In that regard, there is one last disciplinary conversation that I must respond to before moving forward.

Over the past twenty years, scholars within rhetoric and composition, computers and composition, and professional and technical communication have attended to the ways in which discourse and knowledge about risk is constructed and disseminated by and among various stakeholders (e.g., Ding, 2009; Grabill, 2007; Simmons, 2007; Herndl, Fennel, & Miller, 1991; Mirel, 1994; Winsor, 1988). Early studies of risk within rhetoric and composition adopted interpretive, analytical frameworks which primarily focused on identifying how organizational communication processes contributed to disasters. For example, Dorothy Winsor (1988) examined discourse surrounding the Space Shuttle *Challenger* disaster. Her study revealed that although stakeholders from Morton Thiokol International, Marshall Space Center, and NASA were aware of the risk

of potential O-ring failure, the stakeholders were motivated to understand, interpret, and communicate those risks in unique and oppositional ways. Similarly, Carl Herndl, Barbara Fennell, and Carolyn Miller (1991) used a multidisciplinary approach in order to examine "the relationship between communication and social structures" with respect to the nuclear accident that occurred at Three Mile Island and the *Challenger* disaster (pp. 280-281). While each of these studies expanded the field's knowledge of how that risk is constructed and communicated within and between organizations, each relied on analysis of print artifacts, particularly memos and reports. In other words, the limitation of these studies is that each focused on the ways that organizational knowledge about risk was constructed and communicated by means of alphabetic literacies.

Indeed, the earliest examinations of the relationship between multimodal literacy the rhetorical construction and communication of risk stem from feminist researchers Elizabeth Cartwright (1998), Lisa Mitchell and Eugenia Georges (1998), Mary Lay (2000), Barbara Dixon (1999), and Beverly Sauer (1994; 1996; 1998a; 1998b; 1999) who sought carve our a space for "embodied knowledge" to exist with the types of official statements promulgated by experts affiliated with powerful institutions and governments. Elizabeth Cartwright (1998) examined the ways that knowledge about the risk to fetuses is constructed using electronic fetal monitoring (EFM) technology, and argued that such technology allows medical practitioners to translate aural data (heartbeats) into visual data which can then be used to support knowledge claims about the health risks of mothers and fetuses. Lisa Mitchell and Eugenia Georges (1998) examined the ways that ultrasound imaging was used to visually depict risks to fetuses/mothers that physicians and sonographers could use as evidence to support arguments for medical interventions

(p. 106). Yet, the scholarship of Beverly Sauer (1994; 1996; 1998a; 1998b; 1999; 2011)—including her study of mining, *The Rhetoric of Risk* (2003), which investigated the relationship between discursive ways of knowing and communicating risk (e.g., memos; policies; written standards; laws) and "embodied knowledge" and ways communicating risk (e.g., gesture, movement, and "pit sense")—has demonstrated the most sustained focus on the relationship between multimodality and risk. Indeed, as Sauer (1998a) has previously argued, situations of risk alter the rhetorical situation, and thus impact practices through which knowledge is constructed and communicated:

> Safety engineers can prepare a general plan, but individual workers must decide on when and how to adapt these plans in high unpredictable and uncertain local conditions. The problem of risk thus challenges conventional notions of instructions and procedures that can be formulated prior to an understanding of material conditions in local environments and raises questions about the ways that texts might represent knowledge that is embodied, sensory, and uncertain. (p. 132)

What was most unique about Sauer's approach, however, is that she particularly focused on the ways that miners, a group of blue-collar technical communicators, occupied a liminal subjective position whereby they were simultaneously officially insiders of an organization that constructed official statements silencing their own meaning making practices. That is, Sauer's approach differed from that of Mitchell and George (1998) or Cartwright (1998), because the subjects of their studies were patients, members of the public to whom medical discourse is officially directed.

More recently, examinations of risk, literacy, and multimodality within rhetoric and composition have taken a digital turn. In particular, scholars have turned toward examining the ways that publics might leverage new media to independently construct knowledge regarding risk, to enter "expert" conversations about risk, and to disrupt the one-way "rhetoric of information" often associated with risk communication (Grabill, 2003, p. 133; Ding, 2009; Grabill and Simmons, 1998; Grabill, 2007; Lay, 2000; Simmons and Grabill, 2007; Simmons, 2007; Potts, 2014; 2009; Potts and Harrison, 2013). For example, Huiling Ding (2009), Liza Potts (2009), Mary Lay (2000), W Michelle Simmons and Jeff Grabill (2007) have examined ways that "non-expert" communicators can build rhetorical agency and ethos by utilizing computer mediated literacies in order to build persuasive arguments that counter dominant narratives about risk.

Lay (2000), for instance, examined the ways Minnesotan midwives used listservs to organize, construct, and vet arguments regarding the safety, validity, and legality of midwifery before the information was presented in public hearings. Ding (2009) researched the ways that government insiders and publics in China utilized non-official channels—"independent overseas Chinese Web sites" as well as "text messages and word of mouth" (p. 327)—to construct and disseminate risk knowledge about the SARS outbreak. And, Potts (2009) examined the ways that people made use of Web 2.0 composing tools such as Flickr and blogs in order to construct knowledge about the July 7, 2005 bombings in London. These studies demonstrate that rhetoric and composition is beginning to account for the emerging ways that knowledge and risk are constructed and communicated with and through new media technologies, including the ways that

audiences might use technologies to build greater agency and promote opportunities for increased public participation in settings where risk management decisions are made.

Still, the work of Lay (2000) and Sauer (2002) stands alone to some extent, because each examined a population of workers who might neither be classified the type of "insider/experts" who author official in—situational discourse regarding risk communication, nor classified as the type of "outsider/non-experts" who are the intended audience of that official institutional discourse. In doing so, Lay and Sauer, revealed that miners and midwives, respectively, made use of unique multimodal, practitioner literacies —*techné*—that circulate between the insider/expert discourse and outsider/public discourse. Quite simply, in tracing the way that multimodality, literacy, and risk have intersection across the field of rhetoric and composition writ large, I have come to identify that there is an substantive gap in research related to the ways that blue-collar workers construct and communicate knowledge. I believe that there is still much to learn about the reading and writing that gets done by way of welders', plumber', electricians', subway drivers', boilermakers', and/or crane operators' know how. There is much to be learned from a *blue-collar techné* like knowing how to read if a bolt is standard or metric or the way a mechanic knows exactly what is wrong by feeling or listening to vehicle.

Towards that aim, this dissertation catalogues notable examples of the ways that firefighters enact multimodal literacies in their practices. While I regularly employ the string of words *multimodal literacy practices*, theoretically, I consider firefighters practice of literacies—the ways in which they read and write to construct and communicate knowledge at an inter- and intra- personal level—as thoroughly embedded within, and inseparable from, the larger situated practice of firefighting. That is, I understand

multimodal literacies as practices by which bodies, material, and cognition are interrelated within activities that are culturally, historically, and geographically situated. I believe that firefighters have a great deal to say about risk, multimodality, and literacies because they regularly respond to rhetorical situations that are conspicuously riddled with these elements. Most simply, *Firefighters' multimodal literacy practices* is a field based study that puts writing, activity, and genre research (WAGR) in dialectical tension with multimodal research (MMR) in order to explore the ways that embodied, print/analog, digital media and genres with kinesthetic, tactile, aural, oral, alphanumeric, spatio-temporal, and visual modalities intersect as they are woven into complex, multi-dimensional practices for reading and writing that support and facilitate the work that firefighters perform.

In this chapter, I have carved out an exigency for why this type of research matters, and situated the importance of this study not only within the field of rhetoric and composition but within the fireservice, the practitioner community for whom this research matters most.

In Chapter Two, I sketch a *heuristic methodology* (Sullivan & Porter, 1997) that was designed by borrowing and adapting *methodological components* (Grabill, 2012) from (1) mulitmodal and digital ethnography, (2) community based research, and (3) writing, activity, and genre research. I then introduce audiences to my research site, the Alliance Fire District Training Facility. Thereafter, I outline how data was gathered at the municipal fire academy. Specifically, 75 participants practiced firefighting activities during six observational periods. In order to capture observational data amidst a structure filled with smoke and heat, I donned my own personal protective equipment and used

digital research methods. For instance, to capture oral and radio communications as well as ambient soundscapes, I placed audio recorders within the pockets of firefighters' protective gear; to capture movement, color, touch, and other visual data, I placed a high definition camera outside of the structure, mounted temperature-resistant cameras onto tools that firefighters carried throughout the structure, and created an interface that enabled me to record digital video footage of the analog imagery broadcasted from a thermal-imaging camera I carried inside the training structure. I supplemented observational data by photographing artifacts and conducting semi-structured interviews with 16 participants.

In Chapter Three, I begin by outlining how I adopted CHAT to enact a descriptive analysis that traces the examples of the types of alphabetic, kinesthetic, tactile, spatial, aural, and visual genres that firefighters used to communicate and construct knowledge across one of the six observational data-sets. Specifically, this chapter introduces audiences unfamiliar with firefighting to this unique discourse community by enacting its discourse and accounting for a range of its subjects, tools, and object/ives. By and large, this chapter aims to (1) render firefighters' multimodal literacy practices visible, (2) demonstrate a range of the multimodal genres that circulate on firegrounds and (3) highlight the ways that these multimodal genres intersect within richly layered practices.

In Chapter Four, I bring in the voices of my research participants, so that they might explain how and why they understand and value mulitmodal literacies in their own terms. Drawing from interviews with twelve of the sixteen participants who volunteered for this phase of the study, I continue to take stock of the types of alphabetic, kinesthetic, tactile, spatial, aural, and visual genres they note. The chapter is structured surrounding

six themes that emerged during by double coding the interviews using grounded theory (Glaser & Strauss, 1967). In particular, this chapter examined the ways that participants described their multimodal literacy practices as (1) interpenetrated, (2) bound to rank, (3) idiosyncratic, (4) subject to differing affective longevity, (5) useful for framing, interrupting or reframing affect, and (6) tools for obstructing, coping with, and distancing from, the affective weight of traumatic events. For instance, Captain Lynch, a line officer in a large career department, explained that whenever an alarm sounded for a structure fire during the first fifteen years of his career, he would pop a piece of gum into his mouth because the calming, monotonous rhythm of this ad hoc, tactile-kinesthetic genre enabled him to frame his affective response toward the chaos, unpredictability, and instability he confronted while responding to emergency scenes.

In Chapter Five, I populate the genres traced within Chapter 3 and Chapter 4 within activity system diagrams and genre ecology maps in order to illustrate and analyze the relationships between firefighters and multimodal literacy practices. The activity system diagrams demonstrated that alphabetic, print-based literacies tend to be used more commonly away from emergency scenes by firefighters' occupying higher ranks and that access to oral, radio-based literacies was greater for those ranking lieutenant or above, for example. Moreover, making use of data driven documents (D3), I expanded on Spinuzzi's technique of genre ecology mapping (2003a; 2003b) to visualize and analyze relationships between different genre assemblages (Spinuzzi, 2004) that were observed across the datasets. Affirming the diversity of multimodal literacy practices by which humans might construct and communicate knowledge, I conclude by arguing that attending to the ways that alphabetic, kinesthetic, tactile, spatial, aural, and visual modes

are entwined to form multimodal genres deployed as mediational and communicational genres within ecologies of practice, allows for an expanded view of "how work is coconstituted at the different levels of scope" (Spinuzzi 2003a, p. 36).

Finally in Chapter Six, I suggest why I believe firefighters' *blue-collar techné* complicates predominant views of literacy, problematizing the premise that knowledge work is an exclusively white-collar symbolic-analytic activity.

In sum, the trajectory of the dissertation attempts to explore the ways that different methods for collecting and analyzing data about firefighters' multimodal literacy practices offers distinct views of such practices. I believe that exploring the different views the datasets provide not only yields a view of the ways that distinct subjects, genres, practices, and tools are over- and underlooked, but also helps us to better understand the ways that different actors have different levels of access to different types of genres, tools, and practices. Whereas the observational data discussed in Chapter Three revealed how genres, practices, and tools visibly or audibly circulated at a surface level, the interview data examined in Chapter Four directed attention to the ways that genres and tools were used as components of larger literate and rhetorical practices central to the activity of firefighting. Indeed, participants mentioned using ad hoc genres and practices involving mediational genres like mnemonics and cognitive heuristics, which would have otherwise been invisible, that functioned as important components of the firefighters' generic responses to recurrent situations. Chapter Five, which interrelated these two data sets, revealed that participants were often unaware how genres had been historically sedimented or operationalized through practice within the activity of firefighting.

CHAPTER TWO

Building rapport: You go, we go

> You do not simply transport methodology, you adjust methodology to setting and the theory—and your explanation of this adjustment becomes a significant feature of your write-up of that study. (Sullivan & Porter, 1993, p. 236).

> If embodied information is not present in written communication, we might ask, where is it located? In future research, we must describe those sources of information outside of texts—such as gesture—where experts represent embodied sensory information not articulated in written texts and procedures. (Sauer, 1998, p. 161)

> There is a dearth of available literature pertaining to the impact of human fact[ors] on effective fireground communication. (USFA, 1999, p. 2)

Research questions and methodology

Broadly framed, this study explores the everyday literacy practices of an extraordinary group of technical communicators. More specifically, it examines the ways that firefighters' literacy practices are situated within, and contribute to, the larger ecologies of practice associated with firefighting. "Firefighters' Multimodal Literacy Practices" addresses three interrelated research questions: (1) How do firefighters use multimodal literacy practices to construct and communicate knowledge? (2) How do the situational exigencies firefighters encounter as technical communicators relate to such multimodal literacy practices? (3) How do multimodal messages circulate and evolve within environments where risk is present?

Through the process of building a research design to address these questions a variety of pragmatic, ideological, and ethical challenges emerged which led me to question the appropriateness of applying preexisting methodologies to this study. For

instance, identifying as a firefighter[7] myself, I understand that many of the locations where firefighters work are riddled with physical, emotional, and legal risks. However, because I also identify as a rhetorical scholar and researcher, I realize that the practices firefighters use to construct and communicate knowledge are imbricated within environments where such risks are inherent components of the work. Certain that I needed to appropriately balance the risks and rewards of the research activity, firegrounds —and, other actual emergency scenes where firefighters work—were excluded as a potential site for conducting fieldwork. Conversely, training grounds—locations where firefighters practice in realistic but controlled settings which are relatively safe—seemed an appropriate location for employing fieldwork, but posed a set of different challenges. Naturalistic approaches, for example, offered useful practices for limiting researcher intrusion and mitigating disruptions to the training activities held in these locations, but some of the procedures for data collection associated with this approach—such as taking field notes in situ—were ineffective methods of detecting and logging examples of the fleeting multimodal literacy practices sought as data. Again, the process of research design prompted me to anticipate challenges that might be encountered in the field, and compelled me to construct a responsive methodology that could counterbalance these complex research demands.

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[7] For over fifteen years, I have served as a firefighter in the Westerly Fire Department (WFD), a municipal volunteer fire department in the town where I have resided for most of my life. I am also fire instructor at the Rhode Island Fire Academy (RIFA), a logistics specialist with the Rhode Island Urban Search and Rescue task force, and a fire instructor at the Alliance Fire District Training Facility (AFDTF). I maintain the follow certifications and/or trained to the following standards: National Incident Management System/ Incident Command Structure (ICS100; ICS200; ICS700; ICS800); Firefighter I & II (NFPA 1001); Driver-Operator for Pump Apparatus (NFPA 1002); Fire Officer I (NFPA 1021); Fire Instructor I (NFPA 1041); Live Fire Training Class A & B-Excluding Acquired Structures (NFPA 1403); Incident Safety Officer (NFPA 1521); Hazardous Materials Operations; Rapid Intervention Team; Hydraulic Vehicle Rescue; Heavy Rescue; Surf Rescue; Swift-Water Rescue; and Rescue Systems 1.

To respond to these demands, I turned to Patricia Sullivan and James Porter's framework for heuristic research design which works from three central tenets: (1) Research is itself a situated activity that has consequences; (2) Researchers should aim to empower research participants by valuing and affirming the ways that human subjects describe and understand their own practices; (3) Research methodologies should be built and adapted rather than selected and applied ready made (1997;1993; Porter & Sullivan, 1996). An additional benefit of Sullivan and Porter's framework, as Jeffrey Grabill (2012) explained, is that it offers a robust conceptual language through which researchers might break out the constituent parts that comprise methodology:

> Perhaps the most significant move they make in this framework is to distinguish between *method* and *methodology*. For Sullivan and Porter, *methodology* is the proper "larger" term for thinking about research. A methodology is a theory of research, and any given methodology articulates concepts like stances, methods, and practices. [...] In Sullivan and Porter's model, something like "ethnography" is not a method. It is a methodology, which means that a particular approach to ethnography has an ideological component (a theory of human relations), a practice component (how people actually constitute their relations with each other) and a method component (tools). (p. 212)

Following Sullivan and Porter, then, this chapter outlines a methodology that was constructed by borrowing and adapting components from (1) multimodal and digital ethnography (Bezemer, et al, 2012; 2011 Hurdley & Dicks, 2011; Kress, 2011; Murthy, 2008; Pink, 2011), (2) community-based research (Blythe, Grabill, & Riley, 2008; Grabill, 2007; Simmons, 2007), and (3) writing activity and genre research (Bazerman &

Russell, 2003; Russell, 2009; Spinuzzi, 2012; 2011; 2003; Spinuzzi, Hart-Davidson, & Zachry, 2006).

Each section of this chapter not only includes disciplinary bases for the use of specific components borrowed from respective approaches, but also provides descriptive accounts of how components were adapted to respond to the types of pragmatic, ideological, and/or ethical challenges of this research project. The first section outlines how aspects of my identity influenced this study. The second section explains how I constructed trust with stakeholders who provided access to the research site. The third section illustrates the procedures and methods used for participant enrollment and data collection. The fourth section details how data was coded. The last section describes procedures that were used to analyze the data as well as build validity for the findings.

Research stance: Identity, positionality, aims

Recently, Grabill (2012) offered a concept, *research stance,* which he defined as "a 'position' relative to issues like purpose, goals, and methods for research" (p. 215). As Grabill explained, researchers establish their stance by clearly articulating their identity, aims, and ethical commitments (p. 212). In this section, then, I briefly elaborate the concept of *research stance*, including why it is important to my own study, before outlining aspects of the stance I constructed during this project.

Within ethnographic approaches, the concept of *positionality* is used to refer to a researcher's situatedness within the activity of research (e.g., Fine, 1994; Denzin, 2003; Madison, 2011; Noblit, Flores, and Murillo, 2004). As framed by D. Soyini Madison (2011), positionality is a tactic which illuminates the underlying motivations that sponsor

ethnographic research, including the relationship and power researchers exert as producers of knowledge:

> Positionality is vital because it forces us to acknowledge our own power, privilege, and biases just as we denounce the power structures that surround our subjects. A concern for positionality is a reflexive ethnography; it is a turning back on ourselves. When we turn back on ourselves, we examine our intentions, our methods, and our possible effects. We are accountable for our research paradigms, our authority, and our moral responsibility relative to representation and interpretation. (p. 14)

Like positionality, Grabill's notion of *research stance* values reflexivity and self-disclosure, but its conceptual difference is notable. Specifically, *research stance* functions as a heuristic which facilitates decisions researchers might make on the front-end of research activity, as well as a reflexive tool which is used recursively throughout the research process. As Grabill asserted, "a stance precedes choices regarding methods" (p. 215). Continuing, he warned that there are ideological consequences associated with applying methods to a research site, instead of choosing methods appropriate to a research site: "if we decide in advance of inquiry that because we are a 'qualitative researcher' or an 'ethnographer' or something else, then we must enter the research scene by leading with our disciplines, our politics, or our methods" (p. 217). For Grabill, researchers establish an ethical research stance by not only proceeding "slowly, carefully, and based on an understanding of who we are as researchers and what it means to research" (p. 217), but also periodically reassessing that research practices are responsive to the needs and aims of communities and individuals sponsoring research. Additionally,

he stressed that research activity should be undertaken with an eye for "maintaining the relationship" that researchers establish with members of these communities (p. 217).

As a firefighter, I hold a deep affinity for the work that men and women of the fire service perform, and this project is motivated by my own respect for the culture, heritage, and history associated with the profession. Moreover, working as a firefighter informs how I understand literacy as a rhetorical theorist, literacy scholar, and composition teacher. My own experience with, and exposure to, an array of visual, oral, aural, alphabetic, kinesthetic, tactile, and spatial genres used on the fireground challenges more limited, traditional definitions of literacy which "privilege print as *the only* acceptable way to make or exchange meaning" (Selfe, 2009, p. 618). Conversely, as a rhetorical theorist, literacy scholar and composition teacher, I often find myself at odds with how communication is framed by, and understood within, the fire service. A microcosm within the larger aggregate of working-class professions, the fire service proudly brandishes its blue-collar work ethic as a skilled trade, including a heritage which tends to value *doing* over *saying*. The USFA (1999), for instance, found that "while fire departments devote substantial time to manipulative skill training, relatively little training is provided to help firefighters develop stress-tempered communication skills" (USFA, 1999, p. 2). Despite the fact that genres such as reading smoke (e.g., Ballam, 2012. Dodson, 2009; Tippett, 2012) or sizing-up a scene (e.g., Bachman, 2013; Jakubowski, 2010) garner significant attention within trade magazine and fire service blogs, such practices tend to be framed in functionalist terms, discounting the epistemic and rhetorical knowledge work that is an important part of firefighting.

In terms of my *identity* as a firefighter and an academic, then, I occupy a liminal position between the distinct communities of practice where I teach, research, learn, and work. My identity, in other words, impacts my *positionality* as a researcher because I have a level of insider access to the practices and discourse of firefighting, including the extraordinary stock of multimodal literacies that firefighters have inherited, developed, and adapted to construct and communicate knowledge. Yet, these experiences are also a potential bias, especially when considered in the light that as a scholar-researcher I am necessarily positioned as an outsider, simultaneously. My dual identity as a scholar-firefighter has an ideological impact on how I understand the relationship between physical and cognitive work. While work has been historically subject to a Cartesian binary which delineates and classifies work as either a white-collar (knowledge workers) or a blue-collar (laborers) activity, I am inclined to value both the cognitive and physical components of work activity. Furthermore, I consider divisions which devalue the interrelationships of such components as artificial and problematic. Because I am committed to a specific ideology, then, my situatedness as a researcher is a site of struggle between those who tend to frame white-collar, knowledge work as exclusively/predominantly cognitive and blue-collar labor as exclusively/predominantly physical work.

However, my *research stance* is also informed by the theory of research articulated within the work of Stuart Blythe, Jeff Grabill, and Kirk Riley (2008), Grabill (2007), Michelle Simmons (2007), as their approach has had a significant ideological influence on the methodology constructed within this study (see also Porter et al., 2000;

Simmons & Grabill, 2007; Grabill, 2003).[8] The first wave of inquiry that has enacted Sullivan and Porter's heuristic research methodology in practice, this body of research demonstrates that researchers can build successful partnerships with communities to identify and respond to existing research and information need. For example, in a collaborative project taken up with members of a community called "Harbor," Blythe, Grabill, and Riley (2008) argued that their approach "shared hallmarks of action research," but followed Toulmin (1996) in noting that "action research comes in many varieties, including cooperative inquiry, participatory design, and participatory action" (p. 2). Additionally, they concluded that "perhaps no methodological tradition can be defined clearly enough to fit one label" (p. 2). More recently, Grabill (2012) has framed this strand of inquiry as a distinct form of community based research (CBR). While CBR may refer to a wide variety of research traditions with unique disciplinary and theoretical trajectories such as action research (e.g., Altrichter, et al., 2002; Huang, 2010), participatory research (e.g. Gaventa & Cornwall, 2008), participatory action research (e.g., Borda & Rahman, 1991; Freire, 1982), Grabill explained that a central tenet of CBR is that it is taken up *with*—not on—research participants (p. 211) and empowers participants by "privileging action and change as outcomes, and valuing user (or local) knowledge" (2012, p. 217). Indeed, his expansions track well with Blythe, Grabill, and Riley's (2008) earlier sentiment "that the goal of all forms of action research is to produce knowledge that benefits some nonscholarly community (or communities)" (p. 2).

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[8] Pointing to the work of Ellen Cushman (1998), for example, W. Michelle Simmons (2007) stated "activist researchers [that] have worked *with* individuals and communities to help bring about significant positive change...ensure that their help is wanted and the changes are ones the individuals themselves identify" (p. 77).

The more global concern that motivates this project is firefighter safety and survival. Despite the fact that the past thirty years have been marked with innovations in equipment and technology, increased training and education, as well as refined tactics and strategies, over that same period an average of 100 a year firefighters perished in LODD (USFA, 2014 ; NIOSH, 2013c). Without question, firefighters work in environments that are dangerous: they engage in interior fire suppression operations amidst superheated gases, fire, and smoke; they undertake ventilation operations atop of compromised roof members; and they perform search and rescue efforts to locate and extricate victims on, below, and above fire-floors. However, the review of literature offered in Chapter 1 demonstrates that the relationship between LODD and communication is not well understood within the fireservice, and reveals that little research has examined the rhetorical and/or literacy practices of firefighters (USFA, 1999).

While it is my hope that this project creates knowledge which might contribute to this gap in research—and compels firefighters and scholars of rhetoric, literacy, and technical communication to build subsequent research partnerships—at a more local level it is my hope that participants have garnered a greater awareness of how multimodal literacies might be utilized on the fireground, and that this awareness might help the participants to identify areas where communications and literacy practices connect to fireground breakdowns and issues of firefighter safety. Toward such ends, my *research stance* consists of three interrelated aims: (1) I aim to affirm and honor the diverse ways that participants might understand their own literacy, writing, and communication practices "on their own terms and in their own interests" (Grabill, loc 2724); (2) I aim to document examples of the multimodal literacy practices that are an important and

valuable component of the work that these technical communicators perform during firefighting; (3) I aim to make use of participatory research design that is sensitive to the needs and desires of participants.

In short, *research stance* is largely related to *how* a research methodology is enacted. Certainly, aims and ideologies are important components of a methodology, but choices regarding how relationships with communities are forged, how methods for data collection are selected and implemented, as well as how analysis is performed also contribute to a research stance. In the following sections of this chapter, then, I outline the types of factors that surrounded choices, illustrating how methods and practices from three distinct approaches were adapted to build opportunities for doing CBR *with* participants. As a researcher my goal was reach out to a community of firefighters with whom I already had a preexisting professional relationship, but I understood that entering this site as a researcher might alter the relationships I had already formed with members of this community. Because I have a deep respect for members of this community and the work that they perform, I was compelled to do research in ways that would preserve the relationships I had with members of this community. I had a vision for a research project, but I also wanted to ensure that the project would contribute to the local needs of a site, and would empower participants to have a hand in the design of the research project.

Developing a project: Community, trust, access

While progressing through coursework as a Ph.D. student, I assumed increasing levels responsibility within the Westerly Fire Department, serving first as a a departmental training officer and a company officer. With an already established passion for teaching and a desire to become a more effective training officer within the department, I enrolled

in a state level training program at the Rhode Island Fire Academy (RIFA) to become a certified fire instructor in the spring of 2010. As part of the training program, senior instructors introduced us to firefighter fatality investigation reports that the National Institute for Occupational Health and Safety (NIOSH) is congressional mandated to carry out. Serendipitously, I was also enrolled in a research methods seminar that semester, and found myself engrossed in learning how to identify the affordances and limitations of different types of research designs. Applying my newfound knowledge to the investigation reports, I discovered that NIOSH investigators frequently cited communication issues as contributing factors in firefighter fatalities. When we were asked to develop a research proposal for a mock dissertation study, I combined my interests and proposed a study of firefighters' multimodal literacies.

Over that summer, I completed the fire instructor training and earned a certification as a NFPA 1041 fire instructor. The instructors had encouraged those of us who were interested in teaching to apply to become state instructors with the RIFA. I applied, and completed my student-teaching hours during the fall of 2010. That December, I was invited to attend a holiday party hosted by the Rhode Island Association of Fire Chiefs (RIAFC). At the party a friend formally introduced me to Deputy Chief (Dc.) Kavanagh and Chief Farrelly of the Alliance Fire District (AFD) located in Southern New England. Aware that the two men operate the Alliance Fire District Training Facility (AFDTF), a municipal fire training facility, I inquired about opportunities teaching at their facility as a fire instructor. They encouraged me to apply for instructor training at AFDTF. In the Spring of 2011, Chief Kavanagh emailed me to inform me that I had been approved by Chief Farrelly to begin my instructor training at

AFDTF. At first, I mostly observed instructors or helped the burn crews prepare and maintain the combustable materials during live-fire training evolutions at the training facility, but as the leaders and instructors at the facility began to develop confidence and trust in my capabilities, I was assigned to interior safety crews. In the Summer of 2011, I received notification that the State of Rhode Island's Fire Education and Training Coordination Board had reviewed my application, and that I was officially appointed as a RIFA instructor. In the Fall of 2011, Chief Farrelly invited me to become a regular instructor at the AFDTF.

During this same period, I successfully passed the written portion of the Ph.D. comprehensive exams, and began discussions about a dissertation project with my major professor, Libby Miles. She knew that I was interested in conducting a study that surrounded firefighters and multimodal literacy, and we began streamlining ideas for a manageable dissertation project that I could pitch to the members of my examining committee. When the committee convened, I presented a couple of variations of research projects to my committee who, in turn, suggested ways that I might further refine the project. Libby and I, again, took to the task of working out a research proposal that would address the advice and direction that my committee had offered. In the Spring of 2012, we organized the committee again in order to discuss a number of potential research sites. For instance, we discussed the logistics of studying firefighters' literacies in the field, and, as fascinating as it seemed, that study seemed inappropriate and insensitive because these public servants are regularly called to tragic and traumatic events wherein they encounter fellow citizens at their most vulnerable. Ultimately, we decided that, if it was possible, AFDTF would be a great location because it would enable opportunities to observe

firefighters' multimodal literacy practices while avoiding a variety of ethical, legal, and/or safety issues that were associated with performing research in uncontrolled settings.

When I garnered committee approval, I had worked under the direction of Chief Farrelly and Deputy Chief Kavanagh at the AFDTF for two full training seasons and had gotten to know the two leaders quite well. I had built a profound level of respect for Chief Farrelly, Deputy Chief Kavanagh, as well as for the instructors and firefighters who had spent so much time teaching me the ins and outs of the facility—men and women who had warmly accepted me into their ranks as a fellow instructor. While I did not realize it at the time, I was engaging in "commitment acts" (Feldman, Bell, & Berger, 2003). Commitment acts are unique from a research perspective, as Feldman, Bell, and Berger argued, because such acts are "not deliberately undertaken to build rapport...":

> [Commitment acts] sho[w] a level of engagement that [provide] researchers the respect and trust of the people with whom they [are] building relationships. [...] There is no guarantee that any particular act will affect the relationship in a positive way. It may, in fact, be just this quality of commitment acts that makes them work. (p. 37)

Indeed, when I began working at AFDTF, my sole motivation for doing so was to build experience as a fire instructor. Due to the serious nature of the work we perform at AFDTF, I have developed a professional relationship with command staff and instructors that is built upon a deep mutual trust. Working at AFDTF, instructors and command staff, learned that I can be counted on to act appropriately during intense and dangerous training situations, just as I have learned that I can trust them to make the decisions that would keep me safe while I worked at the facility.

As part of the proposal process, I needed to formalize access to a research site. My interest in pursuing AFDTF as a research site stemmed from the enthusiastic replies I had received from instructors at the AFDTF whenever I informally broached the topic of carrying out a research project. I had tested the waters with members of other firefighting communities that I had considered partnering with, but members of AFDTF seemed much more interested in the notion of doing research. For instance, one day Capt. Lucey, Ff. Parker, Ff. Wilson, Ff. Hall, and I were cleaning out the burn-building after a day of live-fire training evolutions when Ff. Hall and Ff. Wilson began a round of the boisterous repartee that tends to accompany mundane work in the fire service.[9] Ff. Hall and I were already friends—we had met during the fire instructor course and worked on a number of group projects together—but it was the first time I had worked with Capt. Lucey. The playful banter turned more serious when Capt. Lucey learned I was a Ph.D. student, and he wanted to learn more about what I studied. I explained that was interested in literacy, rhetoric, and technical communication, and ventured a definition of multimodality. The instructors realized that I considered firefighters to be a group of sophisticated technical communicators, and excitedly began telling stories about communications issues that they had encountered, offering examples of the types of "multimodal literacy practices"

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[9] One defining characteristic of the members of the AFDTF is a tacit expectation that members remain humble and grounded. While Ff. Hall considers me one of his own, he also playfully teases my penchant for intellectualism by referring to be as a smarty-pants. Because I know Ff. Hall well, I realize that he values the work I do as an academic and researcher, but I also consider his jokes a subtle reminder that I should remember where I come from and keep my hubris in check. Firefighters, whose work is often subject to policies and regulations imposed by department administrators, politicians, and engineers with little or no direct field-experience, tend to find it highly disrespectful when their own practitioner knowledge is not taken into consideration. Generally speaking, the firefighters I know tend to be somewhat skeptical of white-collar work, including other firefighters who are promoted to administrative positions (commissioner, chief, deputy chief). If these leaders fail begin to honor and respect the blue-collar working class tradition from which they have emerged, subordinate members display contempt and resentment for them.

that they thought mattered most to firefighters. The interactions I had had with other instructors left me hopeful that AFDTF would be an ideal community to partner with for a research project, but I also understood that the type of formal access I needed would need to be granted by Chief Farrelly who is ultimately responsible for the facility.

In the summer of 2012, I reached out to Chief Farrelly to discuss the potential for conducting a research project at AFDTF. He agreed to meet me, and asked that I come to his office at the district headquarters. To demonstrate my professionalism as a researcher, I came to the meeting with copies of the research proposal and the approval form that my committee had signed. When he welcomed me into his office accepting the documents, it appeared that he appreciated my preparation but stated that he would look at them later. Putting them aside, Chief Farrelly shared a story about how he had helped his brother, a research scientist, collect samples from a swamp for the dissertation project he had completed long ago. Continuing the story, he rose, signaling that I should follow him. We went down a set of stairs to a location at the facility where equipment is stored. While he inspected and reorganized the equipment, he asked about a recent mill fire that my department had responded to via mutual aid. I shared details about the fire, in turn, asking him about a commercial fishing vessel fire that his department had helped to extinguish. Holding a piece of equipment, he paused and turned to me so that he could ask me details about the study. I told him what I hoped to accomplish, and proposed suggestions about how we might carry out the research. He offered input about what I might do, too. I could tell that he was especially interested in my desire to involve him and instructors in the process of designing a research study. I explained that I believe that research should strive to make a contribution to the community which participates in the research activity.

Figure 2.1: An inspirational quote inscribed on a steel I-beam at the AFD headquarters.

Looking me square in the eyes, Chief Farrelly explained that he saw it differently, "You work hard as an instructor, and help us out here all the time. You want us to help you out —well, I think we owe you that. It's our way of giving back to you for what you've done for us. You just let me know what you need, OK." I explained that before anything I needed a formal letter from the site to submit as part of the institutional review board (IRB) package. He said, "give me a week to look over the paperwork and talk to a couple of people, but I'll do what I can."

Since observing in more detail how Chief Farrelly communicates and interacts with others, it is clear that he genuinely enjoys the people who work with him. He is a charismatic leader who enjoys spending time getting to know the men and women who

work for him. It is clear that he cares for these people, and cherishes the opportunity to lead them. Yet, he has a silent way of communicating, too. There are times when it is evident that he prefers to let actions "speak" in the place of words. For instance, although he is a chief officer who might compel others to action by order of rank, often he will begin a task that chief officers are not expected to perform (such as picking up hose, filling SCBA cylinders, or cleaning air masks). Such actions demonstrate that he will perform any task that is necessary, and that he values the importance of the mundane everyday tasks that are vital to the operation of the department and the training facility. In retrospect, I sense that his actions that day were his way of demonstrating that he was already comfortable with me as a researcher, and that he valued the research I had proposed. While he might have sat reading the paperwork at his desk in a position of power, he instead moved us to a place where we had regularly worked together in the past. By sharing the story about his brother and changing the venue, Chief Farrelly diminished the rhetorical distance between us so that I might feel more at ease as a guest in his facility. It meant a great deal to me to have Chief Farrelly, a person vested with the immense responsibility, take me seriously as a firefighter and a legitimate researcher. Shortly thereafter, Chief Farrelly called me and asked me to meet him at his office, passing his hand of approval to me on AFD letterhead. I had garnered access to conduct research at the AFDTF.

Research site description: The Alliance Fire District Training Facility

The Alliance Fire District Training Facility (AFDTF) is a place with both symbolic and material consequence to the fire service in Rhode Island. AFDTF was built to address a

Figure 2.2: A side-D view of the Class-A burnbuilding at the AFDTF.

practical exigency that the leaders of the AFD faced. Namely, as the fire district became increasingly developed, it became difficult to find locations to do training. The men and women of the AFD needed opportunities to build and refine firefighting skills, but those opportunities were becoming increasingly difficult to provide. In order to address this need, Chief Farrelly envisioned a plan to construct a site on property that the district owned. Farrelly performed significant background research by visiting the Massachusetts Fire Academy, the Connecticut Fire Academy, and the City of New Haven's training academy to learn more about live-fire training facilities. As he explained, no locations like these existed within the state of Rhode Island, and there was simply no place to go to do this type of training. He bought his plan to a taxpayer meeting, but he encountered

significant resistance. One taxpayer stood up and told a wonderful story about how there had been a huge fire on Christmas Day at her home and the firefighters came and saved the day; Chief Farrelly was convinced that this story would sway the crowd to his position. However, the taxpayer's premise for telling the story was to support a claim that the AFD firefighters were already well trained, therefore they did not need the district to invest resources to build a facility for training. The vote passed, but by narrow margins.

As a physical location, the facility is comprised of equipment, buildings, training aids, classrooms, and props that enable firefighters to learn and refine the types of knowledge, skills, and abilities associated with the wide array of occupational responsibilities that fire departments have been charged with and/or inherited. The AFDTF includes a number of forcible entry training props, a designated area to practice vehicle extrication and rescue, a pad for car fires, a SCBA maze, a confined space simulator, a training tower that can be used for standpipe and high rise evolutions as well as high angle, rope rescue training, and a state of the art three-story, class-A live fire burn building. It is the latter that has led to AFDTF's categorization as a premier location for firefighter training not only within the state of Rhode Island and the region of New England, but also at a national and international level.

From the outside, fire has literally left its mark on the building. It is clear that the burn building "has seen its share of shit"—a cheeky but preferred saying with members of this discourse community. In fact, the building itself forebodingly stands with an unyielding presence. Indeed, the facility itself seems to have a way of humbling those who have come unprepared or headstrong. Contorted heavy steel doors and window shutters serve as a visual indicator that fires have reached temperatures above 1,000

degrees F, the melting point of steel (IFSTA, p. 143). Dark, black "V-patterns" vertically ascend from windows and doors where byproducts of incomplete combustion have escaped through these ventilation holes. Inside the building the rooms are dark, except for the faintest slivers of light which crawl in through apertures in the metal window shutters and doors. With the exception of white burn patterns in the ceiling where it has been burned away through exposure to elevated temperatures, a highly flammable thick carbon soot clings to the concrete ceilings and walls of the structure. On windy days the gusts will catch the window shutters and doors—which are left unlatched for safety purposes during evolutions—and cause the steel to rattle with clamorous, gong-like eruptions. On cold days, the concrete is hard and unforgiving; on hot days the walls serve as shields whereby the instructional staff hide from the assault of radiant heat that the training fires emit.

As a symbolic location, AFDTF is literally a mecca for training in the fire service. Nearly any conceivable fire scenario that can be imagined has been realistically simulated at this facility. It is this characteristic that makes AFDTF a highly sought after destination for firefighter training. The RIFA and outside municipalities regularly bring probationary recruits and training academy classes to learn practices, tactics, and strategies of firefighting. Numerous fire departments from across New England regularly bring experienced crews and shifts to refine their operational capabilities. Companies from the New York City Fire Department (FDNY)—long regarded as *the* premier department in the world— have used the facility. International firefighters have traveled to AFDTF from as far away as Greece and Japan with the explicit aim of learning "American" tactics for aggressive interior firefighting. Deputy Chief Kavanagh informed me that one of the

sixteen members of the Hellenic Fire service who paid their own way to travel to and train at AFDTF during the Spring of 2011, stated that the training he received enabled him to escape a fire with his life after he became disoriented and separated from his crew. Even state and federal agencies such as Rhode Island Chapter of the International Association of Arson Investigators (RIAAI), the United States Alcohol Tobacco and Firearms (ATF), and members of the U.S. Special Forces have used the facility in creative ways. The physical construction of the place is important, but these symbolic overlays lend AFDTF and its staff a form of constructed ethos because of the facility's association with these powerful legitimizing organizations.

Still, there is a human factor—seemingly part of an unwritten code— that makes AFDTF a world class facility. There is a considerable wealth of knowledge amassed at the AFDTF, literally hundreds of cumulated years of firefighter experience concentrated within the instructor corps, but the men and women who affiliated within this organization exhibit the character traits of humility, adaptability, and resiliency—perhaps, because the best firefighters tend to understand that firefighting is exceptionally hard to do well, and rarely are any tasks executed perfectly. There tends to be considerable room for improvement, almost always. Firefighters, after all, are people who—unlike fire which tends to be relatively predictable—sometimes deviate from the types of time honored practices that have helped firefighters to prevent, mitigate, and respond to the underlying factors that cause situations of risk in the first place. AFDTF instructors are exceptionally good firefighters and instructors precisely because that they understand why the more and less acceptable practices for accomplishing certain tasks have become standardized, but also place a high value on open-mindedness, as divergent approaches

are considered as potential tools that might be useful in unique situations where more traditional techniques are ineffective.

While the primary aim of the facility is to *teach* firefighters how to do firefighting, instructional staff are regularly *learning* new and useful ways of approaching, teaching, and doing firefighting. I would argue that instead of considering the exchange of knowledge as unidirectional activity, AFDTF instructors have come to embody a Freirean pedagogy for teaching firefighting and appreciate the opportunity to learn new or alternate techniques from the visiting departments who have different ways of implementing practices, tactics, and strategies in practice. This balanced approach to instruction accounts for the esteemed reputation with which AFDTF instructors and command staff are associated by both career and volunteer departments within the state of Rhode Island.

Moreover, while it is not expressly stated, a tacit expectation of the command staff at AFDTF is that instructors not only teach firefighters how to do the job, but to also teach firefighters the right reasons for doing the job. Instructors are expected, without exception, to uphold an ethic informed by respect, compassion, and kindness, to treat visitors well, to contribute to mundane tasks with precision and dedication regardless of rank, to take personal responsibility for safety of self and others, to be vigilant and aware of risks, and to protect each other and the crews in entrusted to their custody. It is an ethic that frequently extends beyond the geographic limitations of the AFDTF, as I've witnessed instructors reach out to support firefighters in need throughout the state, and participate in some of the most generous and caring acts of giving that are imaginable. When a municipality in southern New England went bankrupt and failed to pay the the

career firefighters who continued to work, instructors at AFDTF took up a collection to help these firefighters pay their bills and purchase groceries. When one prominent instructor's daughter became ill, three instructors held an event which raised over $15,000 to help pay for a service dog that she needed to help support her. And, these are just two of the many acts of kindness that AFDTF instructors perform. In a sense, I'd argue that AFDTF instructors act as guardians responsible for the stewardship of the fire service.

Institutional commitments: Planning methods and procedures for data collection

Once I had secured formal access to a research site, I began to address some of the pragmatic, ethical, and safety concerns that emerged during the earlier planning stages. While I needed to my own research questions, I also wanted to develop a research design that could flexibly respond to the questions and research aims which participants might identify. This was challenging because I needed to construct an adaptable research design —so that participants could contribute to the shape and direction of the study—while also providing my committee and the institutional review board (IRB) with a concrete plan about how research activities at the facility would be conducted. Given the types of safety and environmental risks that exist at a live-fire training facility, I anticipated that IRB oversight for the research project would be rigorous. Chief Farrelly had offered me unrestricted access to training activities and the burn building, but it was still unclear what levels of access IRB would sanction. Moreover, even if access was granted, a great deal of uncertainty surrounded the viability of collecting examples of firefighters' multimodal literacies, as these practices are situated in environments where listening is complicated by the presence of loud tools and visibility is reduced due to smoke.

To address these concerns, I began to identify methods and procedures for data collection that researchers of multimodal literacies had successfully used. Drawing from "accident reports, preliminary accident reports...depositions, and interview[s]," Beverly Sauer's examinations of U.S. and British miners had successfully reveled that important forms of "embodied knowledge [exist] outside of conventional written modes of discourse" (1998, p. 133; see also, 2003). Like Sauer's miners, firefighters use a wide array of multimodal literacy practices to construct and communicate the types of "tactic knowledge" and "sensory information" that "is felt rather than articulated" (1998, p. 142). I hoped to extend Sauer's earlier work by leveraging my background as a firefighter to enter realistic, live-fire conditions and collect examples of firefighters' multimodal literacy practices that would render visible the fleeting, idiosyncratic, and situationally contingent practices through which firefighters construct and communicate knowledge. In short, I needed to develop methods that would allow me to watch, listen, and record multimodal data at a live-fire training facility, I would need to implement methods in ways that would not disrupt training activities or distract participants, and I had to ensure that I could develop procedures that existing honored safety protocols outlined within local standard operating guidelines (SOGs) and national standards that govern operations at AFDTF (e.g., NFPA 1403; NFPA 1851; NFPA 1981).

While brainstorming safety protocols for the IRB proposal with Libby, we began discussing the concept of risk with respect to the study. She noted that firefighters who visit and/or instruct at AFDTF are already subject to physical and health risks, and that I, as a researcher, should primarily focus on the risks that I might introduce through the activity of research. Moreover, she suggested adapting methods found in naturalistic and/

or ethnographic approaches (e.g., Lincoln & Guba, 1985; Denzin & Lincoln, 2012) such as naturalistic observation (Angrosino, 2007a; 2007b) and field notes (Emerson, Fretz, & Shaw, 2011). Over the past three decades a number of researchers, such as Shirley Brice Heath (1983), Brian Street (1984), Ralph Cintron (1997), and Katherine Kelleher Sohn (2006), had demonstrated that ethnographic and/or naturalistic methods can be successfully used to gather data in studies of literacy. Pointing out different ways that Iranian school children made and communicated knowledge in unique social settings, Street (1984) introduced the concept of "literacy practices" which set a precedent for examining literacy as rooted within larger social processes. In *Social Linguistics and Literacies* (1996), James Paul Gee further expounded on the usefulness of ethnographic methods in helping researchers "to situate everyday language within wider contexts of social practice" (Street et al., 2009, p. 192). Elsewhere Gunther Kress and Theo Van Leeuwen (1996), scholars working in the semiotic tradition, tailored ethnographic methods for inquiry surrounding multimodal literacy (Street, et al., 2009, p. 194). Recently, Dicks, et al. (2011) remarked, "[i]t is perhaps not surprising that literacy studies have been the principal field within which attempts to conjoin the social semiotic tradition of multimodality and ethnography have emerged" (p. 228). Indeed, as attention to multimodality has increased, so too have interests in the relationships between "the study of meaning (semiotics) and of social context (ethnography)" (Dicks, et al., 2011, p. 229). Today a substantive body of empirical literacy research exists which has employed ethnographic methods to better understand how individuals and groups use multimodal literacy practices (e.g., Dicks, et al., 2011; 2006; Kress, 2011; Moss, 2003; Pahl and Rosewell, 2006; Kell, 2006; Pahl, 2003).

Looking for methods of ethnographic data collection that would be appropriate to AFDTF, I realized that a number of researchers had begun to supplement traditional methods of participant observation (which usually incorporates the use of in situ observation, note taking, and/or artifact collection) with digital methods such as using photography, as well as audio and video recording techniques (e.g, Bezemer, et al., 2011; Pratt & Kim, 2012; Pink, 2009; Dicks, Soyinka, & Coffey, 2006; Murthy, 2008). Examining these studies, I began to better understand the limitations and affordances of incorporating digital tools to extend the reach of such naturalistic and/or ethnographic methods. Dicks, Soyinka, and Coffey (2006), for instance, had used field notes, still photography, interviews, and participant-observation in their study of an interactive science exhibit, but remarked that they still "struggle[d] to convey the full multimodality observable within the study setting" (p. 87). Sarah Pink (2009) argued that researchers must "consid[er] how one might use one's own body and senses alongside and in combination with both more classic and contemporary innovative digital research methods and technologies" (p. 10). Michael G. Pratt and Najung Kim (2012) posited that the use of digital tools "requires a greater effort to protect the anonymity of an informant's identity than if you were doing a more traditional ethnography" (p. 24).

Aware of these challenges, I was nevertheless persuaded that digital tools would help me to safely gather data in ways that would align with the operational protocols that exist to protect firefighters who train and instruct at the AFDTF. These methods for observation seemed especially appropriate for this study because digital cameras and recorders could be pre-positioned in locations so that training activities would not be disrupted, and these methods seemed to promise potential for capturing examples of the

types of multimodal literacies that would occur in the controlled locations where participants would be working within realistic, live-fire conditions. Still, I would have to develop protocols for implementing and introducing these tools to the site, so I began to turn my attention toward drafting a proposed research plan to submit to IRB and my committee. In the following paragraphs, I outline the research plan, including safety protocols which were developed and practices which were designed to implement tools for data collection at the training site.

Because of the inherent risks specifically associated with conducting data collection on site at the AFDTF, I began working on a draft of a research plan that I could submit for IRB approval. One decision was to divide data collection into two distinct phrases. For the first phase, which would take place at the AFDTF during live-fire training evolutions, I proposed a range of techniques for conducting naturalistic observation (discussed above), including participant observation, audio and video recording, artifact and document collection, field notes, and reflective journaling. For the second phase, I proposed to conduct the second phase of data collection which would consist of audio and/or video interviews at locations that participants' selected, but specifically excluded the AFDTF when training activities were in session. An additional concern surrounded scheduling phase-one collection activities for the Fall of 2012. Chief Farrelly had offered to set-up trainings specifically for the purpose of this research project, when he extended access to the site. However, during a planning session my advisor and I came to the conclusion that IRB might be more comfortable with phase-one if I attended trainings scheduled to take place at the facility instead of initiating trainings with the explicit aim of conducting research. I called Chief Farrelly, who stated that he

was happy to accommodate my request, as long as the departments scheduled to train at the site were comfortable the idea. This conversation dove tailed into a discussion of informed consent procedures, and he offered suggestions about how I might incorporate that process within the safety debriefing that firefighters receive immediately after arriving at the facility. He also asked that I contact him to work out the finer details once IRB had approved the study.

In order to garner IRB approval for the research, I would have to provide reviewers with a fairly concrete plan prior to entering the site. Following standard procedure for human subjects research, I proposed that firefighters would take place in an informed consent process prior to enrolling in the study, which would allow firefighters to decide if they wanted to participate in the project (or portions of the project) in an official, on-record capacity and/or in an anonymous capacity. Subsequently, I developed an informed consent form that outlined how data would be collected at the site, where data would be stored, how participants could opt out, how I planned to use the data, including sharing my desire to publish research in the future. Aside from the physical risks which firefighters were subject to at the site, the greatest anticipated risks to participants surrounded issues of anonymity related to the planned use of these digital tools. By articulating my plans for how data would be used in the informed consent paper work, I aimed to assuage the concerns that participants and reviewers might have. For instance, the informed consent documents included information that explained, participants could, at any time, opt out of the study, and/or designate portions of the data that they would like me to destroy, discard, and/or redact. Furthermore, I make a commitment within the IRB proposal to ensure that research participants would not be

asked to perform any tasks. Instead, I would preposition video, still photography, and audio recording devices in areas that would not interfere with training activities before evolutions would begin.

In August of 2012, I was informed that institutional approval for the study was granted [IRB Reference #HU1213-010]. Again, I called Chief Farrelly to discuss logistical details and scheduling for the phase-one observations. He asked me to meet him and Dc. Kavanagh at AFD headquarters in South Kingston later that week. When I arrived, we began to discuss the parameters of the conducting observational activities at AFDTF, and the leaders clarified protocols surrounding how and when I could access the site for phase-one. For example, we discussed which training activities and dates would be the best for me to observe. While I had initially hoped to observe a range of activities such as high angle rescue and/or vehicle extrication, Deputy Chief Kavanagh provided us with the Fall training schedule which consisted of ten live-burn evolutions for structural firefighting training. The list included one day evolutions for six volunteer fire departments from New England, a two day evolution for a cadet training academy for career department affiliated with a Rhode Island city, and two dates for live-fire practical evolutions of a program called confident captain, a course that AFDTF offers to a private-contractor which trains and certifies crew-members of ocean-going ships in ship-board firefighting. Because I am an instructor at AFDTF, one concern that emerged from this discussion was the need to schedule research activity on days when there would be enough instructors to prepare the burn building for evolutions in the morning, provide instruction to visiting firefighters, and staff the necessary safety teams.

We also discussed the informed consent process. Chief Farrelly and Deputy Chief Kavanagh realized that although research activities would not disrupt the daily functioning of the site, I would need a short-bit of time to go over the informed consent process with participants. This meant that the time I usually spend helping prepare the building for the evolutions and do other work that is associated with the administration of the training facility would be dedicated to other tasks. Because Deputy Chief Kavanagh is responsible for scheduling and staffing at the training facility, he lead us through a list of the ten live burn evolutions that were scheduled for the Fall. Deputy Chief Kavanagh shared that he was concerned about the ability to meet staffing needs for a number of the scheduled training dates, so I offered to refrain from conducting research on those dates in order to work exclusively as a AFDTF instructor.

Finally, our discussion then turned to a conversation about how to perform the observation within the parameters of NFPA 1403, a rigorous national standard for live-fire training that AFD strictly follows. I noted that the only observations I would make would be those ancillary to my duties as an instructor or member of an interior safety team, and ensured the leaders that I would appropriately conduct myself in that capacity. We then turned toward discussing some protocols for the data collection activities, and I shared the limitations I had agreed to follow with IRB, such as prepositioning cameras and audio recorders. When Chief Farrelly and Dc. Kavanagh began to brainstorm ways to capture audio and video from within and outside of the live burn structure, I realized that these participants had discovered an opportunity to contribute to the design of methods and procedures for data collection.

Members of the media had filmed and recorded video and audio at the AFDTF before, and Chief Farrelly and Dc. Kavanagh were more familiar with the success that others had had in capturing video inside the structure. Chief Farrelly told me that most cameras, if exposed to the heat, would be damaged, so my options were somewhat limited. He noted that he had seen some footage that firefighters had taken using a heat-resistant helmet cameras, and he offered to reach out to see if any of the firefighters he knew would let me borrow one. He also said that a couple of firefighters had some success recording video during a burn using a GoPro, but that these cameras were easily damaged if exposed to heat. Recently, I had spoken with a number of other AFDTF instructors about the study, informally, and asked for their input on these issues. I had learned that there are thermal-imaging cameras designed to record video in live-fire settings. With a price range of 8,000 to 20,000 dollars, these cameras would be cost prohibitive for me to purchase for the study, so I asked if the leaders knew anyone who might let me borrow one. Chief Farrelly offered to call the State Fire Marshal's office to see if they knew of any departments, and said he'd call the sales representative that he purchases fire-equipment from to see if the distributor had any demonstration models we could try out. Dc. Kavanagh also mentioned that he reach out friends in his professional network to see if there might be one we could borrow. As we wrapped up a productive meeting, I asked the leaders if they had ideas about what they hoped to accomplish through this project and if they had any specific questions they were interested in addressing. Each leader shared that they were interested in learning more about my ideas, and they asked if I would be willing to give a presentation at the training facility. Of course, I agreed.

Implementing phase-one data collection: Tools, participant enrollment, and challenges

Having the necessary permissions and a research plan in place, I began the final preparations to implement-phase one collection efforts which would take place during the Fall of 2012 at the AFDTF. Before I could begin, however, I would need to procure the digital tools. Researching tools online, I realized that this study would require a financial commitment on my part. The heat resistant helmet cameras ranged from $250 to $350, GoPro HERO2 high definition video and still photography cameras were on sale for approximately $300, and audio recorders ranged from $20-200, and thermal imaging cameras cost from $8,000 to $20,000 (which put those definitely out of my budget). I went to a number of stores and found two Olympus digital audio-recorders on sale for $25. I knew that they might be exposed to heat or water, and that this would damage the recorders, but these were relatively inexpensive so I decided to purchase them both immediately. I also decided to purchase a GoPro Hero 2 because they came with a housing that might protect the camera from some heat, smoke, and water exposure. Since the camera produces HD footage, I purchased one 32 gigabyte, and two 16 gigabyte emory cards.

Next, I began reaching to ask friends if they knew of any departments which had a thermal imaging camera capable of recording video. The existing relationships I had built with firefighters in Southern New England also proved very beneficial. A friend who serves a neighboring district as a Deputy Chief offered to let me borrow his helmet cam. When I went to pick up the camera from him at his home, he showed me dramatic footage of his crew advancing an initial attack line at a house fire. He also taught me how to operate the Oregon Scientific ATC2K Waterproof Action Cam, informing me that I'd

still need to purchase a SD card for the camera. Later that evening, I searched the company's website and purchased the same camera for just over $100.

I still wasn't having luck finding a thermal-imaging camera, so another friend, a fire marshal, sent out a group email to the local chapter of the International Association of Arson Investigators to determine if anyone knew of any thermal imaging cameras within the region that were capable of recording video. It appeared that no departments had access to this technology, however, a friend from my department saw the email and informed me that he thought a former Chief had put something like that in storage. When I visited him to talk about it, he gave me the keys to the storage unit and said good luck. After two hours of searching, I found a box with an magnetized antenna, a co-axial cable, and a direction booklet from one manufacturer (Scott) and a thermal imagining camera from another (Bullard). From the directions that came with Scott receiver assembly, it was clear that the thermal imager wasn't designed for the receiver and that the antennae was capable of receiving (but not recording) an analog signal from Scott thermal-imaging cameras that were specially equipped with a broadcasting component. My department uses Scott thermal-imagers, so I checked to see if the

Figure 2.3: Bullard thermal imaging broadcast and receiver assembly

receiver was designed to interface with the cameras we were using, but it could not.

Thankfully, at a training unaffiliated to this study that I fortuitously attended, one of the AFDTF instructors was using a Bullard thermal imaging camera that looked similar to, but different from the model that I had found in my department's storage unit. The Bullard Bullard T3 I had found in storage didn't have the transmitter handle, but I recognized that he was using the piece of technology I had been searching for. I asked him if that was the transmitter, and he said that his department just used it to hold the camera. He talked to his Chief, who generously agreed to let me borrow it. The following Monday, I meet his Chief at the department headquarters, and he provided me with a box of hardware and showed me how he thought the transmitter and receiver worked. Last, he provided me a phone number for one of his Deputy Chief's, explaining that he had experimented with the equipment a couple of years ago and recalled that the deputy had success with it. I called the deputy, and he explained how it worked, and also said that it was a little fickle, too. He asked me to try and get it set up, but also kindly volunteered to help me get it running if I encountered any difficulty.

That evening, Erin (my wife) and I tested the equipment. We plugged the coaxial cable from the receiver into the television, and plugged the power unit into an outlet. Then we powered up the camera and the transmitter. At first we weren't having much luck, so we toggled through the settings on the transmitter dial, and played with the input-settings on the television trying to find the signal. When we saw the thermal imaging video appear on the monitor, we took turns walking around the house broadcasting thermal imaging video of our apartment while the other watched on the television screen. I now had a collection of tools that I could use to record the data, including a thermal

imaging camera that could broadcast a video signal, but I needed to figure out a way to record that video. With the help of a colleague at URI who does digital production work, I tracked down a converter and the cables that would allow me to stream the thermal imaging camera's video signal to the MacBook that I planned to use to record the video footage with.

Poised to enter the field, a whole new set of challenges surfaced which complicated the collection of data through phase-one. First, I was initially limited to the nine live-burns scheduled for the Fall of 2012: one career department had scheduled a burn day for recruits in their training academy; six volunteer departments had scheduled live-burns for their personnel; and confident captain—a private contractor that partners with AFD to certify maritime captains in shipboard firefighting—had scheduled two dates. Second, I was also limited by an IRB cap of 75 participants, so I had to be selective of which burns to attend. Third, I had agreed that on days when the AFDTF was short-staffed for instructors, I would not conduct observational activities. Fourth, I hadn't been able to test the tools in the field, so I wasn't sure how well the digitial tools would perform. As August 30th approached, the date which the career department had scheduled, Chief Farrelly informed me that he was having difficulty finding enough instructors, so I excluded the first burn. He also informed me that two volunteer departments had requested to reschedule their dates for the Spring of 2013, so the burns scheduled for September 8th and October 6th were excluded. September 14, the first date with the confident captain program was also excluded due to a shortage of instructional personnel. On the evening of September 15, I prepared the equipment by testing the batteries to the cameras were charged, and checking that I had the SD cards formatted. I

also inspected my personal protective equipment (PPE), shaved to ensure that the mask for the self-contained breathing apparatus (SCBA) would get a good seal on my face, and gathered informed-consent forms and pens.

On September 16, I arrived and at AFD and met Capt. Fields, who had been assigned responsibility for overseeing the training, and a lieutenant from a department scheduled to train at the facility. I explained what I hoped to do that day, and the two agreed to let me discuss the informed consent process. While I waited for the rest of the firefighters to arrive, I set up the equipment and dressed out in my PPE. I placed the GoPro in a static location to provide a wide angle view of the two-sides of the building that would give me the greatest view of the evolutions planned for the day. I placed an audio recorder in the pocket of my turnout gear, and I placed an audio recorder at the command post. I mounted a helmet cam to my helmet, and mounted another camera to a New York hook. When the firefighters arrived for their safety briefing, Capt. Fields and the lieutenant introduced me, and I explained the study and then went through the process of informed consent with the participants. The observations took place for approximately four hours that day, and I had a great deal of success with the GoPro, the audio recorders, and one of the helmet cams, but as the day progressed I learned that one of the participants was a junior-firefighter under the age of 18. Because her age made her ineligible to participate in the study, I informed the participants that I would have to destroy the data.[10] Still, I learned a great deal about positioning of the cameras that day.

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[10] Data was erased from the memory cards, and firefighters who had enrolled as participants were deenrolled. However, some firefighters, like Capt. Fields were present at the site in subsequent dates, and were reenrolled at that time.

For instance, the receiver wasn't capturing the footage I was broadcasting with the thermal imagining camera, and I realized that it needed to be closer to the transmitter.

When the next burn approached, Chief Farrelly called me to explain that he had called the chief officer of the department to get permission for my activity ahead of time. He recounted the conversation, sharing what became a sort of script he used to apprise the leading officers of visiting departments of the project: "One of our instructors is partnering with AFDTF to do a research project on communication. We think this is a valuable activity and encourage you to consider participating in the opportunity to contribute to it." He also stated that the chief had said he approved the participation of his firefighters. In turn, I explained that I would still need time to go through the process of informed consent with the visiting firefighters.

I arrived at AFDTF early on the morning of September 22, and began helping the other instructors prepare the equipment for the day's training evolutions. Once we had prepared the building and constructed the training fires, I prepared the digital recording equipment and dressed out in my PPE. When the department arrived, Chief Farrelly provided the morning safety debriefing, and introduced me: "Hi this is Tim, he's one of our instructors here at AFDTF, and we have partnered with him on a research project. He's going to explain that to you now." I went through the process of informed consent, and asked if anyone had any concerns. While others read and completed the informed consent paperwork, I went and spoke to two firefighters who had raised their hands. I learned that they are both career firefighters, but they volunteer with the department that was visiting. The two explained that, as unionized members of a career department they were contractually prohibited from volunteering, but do so because, in practice, the

department doesn't enforce that rule. While it is a common approach for many career departments to turn a blind eye to the volunteer work that their members perform, on occasion firefighters in some career departments have faced punitive measures. The two firefighters made me aware that they were uncomfortable participating in the study, so I offered to suspend digital observations during any evolutions that they were part of. This ended up being relatively easy to do, because the two wore a style of turnout gear that differed, markedly, from that of the other firefighters.

Having addressed their concerns I dressed out, and the training evolutions began. I went about my normal operations as a burn instructor, except that I recorded data using the cameras and audio recorders that had been prepositioned. Things appeared to go swimmingly, but when I returned home that evening I learned that some data hadn't been captured. One of the helmet cameras had failed to record, and the footage from the TIC camera produced some but not fully usable data. In fact, the latter was grainy black and white and faded in and out with levels of differing image fidelity. This challenge ended up becoming a wonderful opportunity to leverage a participatory framework, because when participants learned that I was having difficulty recording usable footage with the TIC they began to help me troubleshoot the problem. They hypothesized that the thick concrete walls were obscuring the analog radio signal that the TIC was sending to the receiver streaming data into the laptop I was using to record the data.

After the burn concluded for the day, the command staff offered the site to me later that week to do usability testing to locate the best areas for reception within the building, and two of the participants from the study volunteered to help me map out which rooms, floor, and angles yielded the best data. We experimented with the camera,

exploring multiple positions at the site for the antenna-receiver as well as locations to position the analog-digital adapter that enabled the computer to record the streaming analog signal that the camera sent. Using radios I watched the video as the participants walked through the building noting their positions: I would radio back describing the quality of the video. Ultimately, we discovered that the best location for positioning the antenna was the basement level at the corner of the building where the Bravo and Charlie sides meet. Here the camera was closely positioned to transmitter that was housed within the TIC and it offered the ability to successfully record video on the whole basement level, the C and D quadrants of division 1, and the C& D quadrants of division 2.

As a solution to these problems, the command staff at the facility had the training planners had fire-builders construct fires in places that enabled me the best opportunity to capture TIC footage. Specifically, by locating the recording station within my vehicle at the B side of the structure I had ready access to a power source which was an infrastructural complication that I had to work around when an inverter I had purchased failed to provide enough amperage to run one of the signal converters/receivers that was necessary in order to capture recorded data. And, because I was stationed on B side was the closest safe location for equipment that didn't interfere with operations and, also enabled me to transmit signal through only one concrete wall.

Still, perhaps the greatest challenge was that each day that I arrived I had to negotiate my role for the day with command staff and other instructors. Some days I realized quickly that my fellow instructors perceived my role differently than I had, and sometimes differently than command staff understood my role, so I had to take a proactive stance to ensure that fellow instructors understood and supported my research

activities. When I noticed that fellow instructors needed help with the everyday work of the academy, I suspended research activities to support the mundane activities such as cleaning, planning, preparing, and/or instructing in order to sustain the goodwill that I had developed with my peers at the site. Indeed, some days I was regarded more as a worker bee, so instructors and command staff tended to assign more activities for me to complete, whereas on other days command staff simply let me fall in as a co-instructor and perform interior safety recording at will. Put simply, access to the site was based on shifting roles that I played at the site, which meant that at times, shifts in tools and techniques were necessary. When tasks needed to be completed done yesterday, often part of gaining access meant giving up access momentarily. By keeping an eye on the bigger picture and putting the needs and safety of the firefighters first, I built ethos with the officers and instructors running training operations, who, in turn helped me to carry out my research activities. It was not just the right thing to do from a research perspective, but as a firefighter.

All in all, I ended up recording six distinct training evolutions ranging from one hour to eight hours in duration. Only once did every one of the digital data recorders function simultaneously, so it was helpful that I had taken a multi-camera, multi-recorder approach, as I always gathered some video, pictorial, and/or audio data during each of the observational periods. In sum, I amassed over 35 hours of audio and video recordings and over 250 still photographs.

Implementing phase-two data collection: Tools, interview processes, and challenges

After the burns for the fall season concluded, I began the work of identifying firefighters from the larger pool of participants in the observational phase, who were interested in

discussing their multimodal literacy practices in more depth. The greatest challenges associated with this phase of the study was that many of the participants who had attended the training facility during the observational activity did not provide contact information, indicated that they were only interested in participating during the observational phase, or worked/lived at a great distance from the AFDTF and were therefore not easily accessible.

Additionally, a large population of the research population had indicated a willingness to participate in the interviews, but I needed to limit the scope of the project at the same time. Moreover, my goal was to gather interviews from firefighters from both career and volunteer departments from a range of ranks, ages, and levels of experience. I didn't want to push participants into volunteering to speak, if they weren't genuinely interested in interviewing so I conducted interviews with three firefighters who ranked chief or deputy chief, three captains, three lieutenants, and seven privates who either called me to schedule an interview or who broached the topic when I was at the AFDTF.

In chapter four, I discuss the interview protocols in more depth, but one of the most interesting trends was that participants ranking chief or deputy chief requested to interview alone, while the firefighters and line officers who are accustomed to working in small teams on firegrounds (officers ranking captain or lieutenant) requested to interview as groups. Interviews were held at restaurants, firehouses, dispatch centers, and at the AFDTF. While I conducted interviews lasting one to two hours with over 20 participants, some data was discarded for the purpose of data reduction for this project. Interview participants allowed me to audio record the interviews. Specifically, while transcribing data I decided to set aside one set of interview data gathered from two privates at a

restaurant because it was difficult to hear what they had to say because of the ambient noise that the audio recorders had picked up. Additionally, data from an interview held with a lieutenant and a private at a fire station was discarded because there were multiple interruptions at the station, and the firefighters requested to cut the interview short in order to honor their training mandates for the evening.

I now turn to an examination of those data sets. In chapter three, I focus in on one subset of observational data related to a small scale company training. In chapter four, I examine a subset of interview data from twelve participants gathered during five distinct interview sessions. In chapter five, I pull from both of the observational data discussed in chapter three and the interview data in chapter four in order to juxtapose and synthesize how those data sets offer a complicated view of firefighters' multimodal literacy practices. In the introductory section of each of these chapters, I outline the analytical framework that I used to analyze the respective datasets.

CHAPTER THREE

Situating firefighters' literacies in practice: Tracing multimodal genres across a small-scale, live-fire training drill

> Activity theory is a powerful and clarifying descriptive tool rather than a strongly predictive theory. [...] Activity theorists argue that consciousness is...located in everyday practice: you are what you do. And, what you do is firmly and inextricably embedded in the social matrix of which every person is an organic part. (Nardi, 1996, p. 7)

> [CHAT] tunes our attention to multimodality, not as a question of which mode a message might be placed in, but as a question of how multiple modes operate together in a single rhetorical act and how extended chains of modal transformations may be linked in a rhetorical trajectory. This map, in short, argues for attending to the full range of multimodality and to material ecologies throughout the process. (Prior, et al., 2007, para. 2)

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Hovering illuminated, carbon particles enjoy a lazy waltz, as an errant flashlight beam spills into the basement. Except for the fire, the room is otherwise entirely devoid of light. It is an empty darkness, lonely yet calming. In the corner, the blistering flames devour a set of hay stuffed wooden palettes which mutter in a quiet, steady chant of snaps and crackles—pops. As pockets of superheated gases touch off, a wispy walk of flaming fingers tumble across the ceiling, grasping, glowing, undulating. My arms and shoulders warm: the thermal layer of my turnout coat is becoming saturated, absorbing the radiant and convective heat that wafts outward from the fire. Pores issue forth beads of perspiration which convene to form brief pools before trickling down my face. Pressure and friction build within the regulator assembly—a nondescript, faint hum resonates, as I slowly inhale through my nose with deliberate purpose. A rain shower of salty, smoky drops of sweat erupt from the blast of compressed air that fills my SCBA mask—scchhhhkkkuuhhg-sssssttttt, Darth Vader's iron lung. My eyes sting, briefly. I grimace and squinch to relieve a tickling irritation in my nose. I hold the breath, listening: thud, the heavy punch of a contraction pushes a swell of oxygenated blood

through the left ventricle. First, in my neck—the common carotid artery—then, in the external carotid artery, my chest cavity calls cadence for my body. I continue to hold the breath, redirecting my ear's attention outward—away from myself. I place the hubbub of my body and equipment on mute. Outside of the structure I hear a bit a shuffling, a muffled chorus of indistinct voices, the steady rumble of the diesel engine of a fire engine. Ff. Ennis passes beside me simultaneously delivering a pointing wave and a spoken message that cannot be made clear. The face-piece he wears renders his voice a stifled mumble—wuh-wah-wuh-wah-wuh, Charlie Brown's teacher. Dc. Kavanagh's radio volume is set to high. Consequently, Ff. Ennis and I have not been able to communicate the status of the interior operations to the IC. The fire has already passed through the incipient stage into the growth stage. Smoke is beginning to push out through the gap above the side-C door. Lt. Brodrick, Pff. Kehoe, and Pff. McGarrah kneel outside, donning their masks, flash-hoods, and helmets.

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A blue-collar techné: Introducing firefighters' multimodal literacy practices

Often the first line of defense when a natural or anthropogenic disaster befalls a community, firefighters are vested with the jurisdictional responsibly of mitigating a wide range of emergencies. Firefighters obviate trauma that bodies have sustained, extricate humans trapped in automobiles and industrial machines, rappel down mountains and buildings, stabilize critical infrastructures, extinguish fires in structures and vehicles, reduce the environmental fallout associated with incidents involving chemical, biological, radiological, nuclear, and explosive materials, stem waters from hurricanes and floods, and search for people entombed by rubble following earthquakes and tornados. Quite

simply, while fighting fires may be the component of the profession for which they are best known, it is only a portion of the work that today's firefighters perform. After all, humans live amidst a myriad of systems—all prone to breakdown—and historically, firefighters have exhibited a reliability that is steadfast, resolute. From a rhetorical perspective, this all exigency response force has a tremendous responsibility: firefighters are technical communicators who not only must be able to rapidly analyze contextual cues and assign an emergency a generic classification (e.g., residential structure fire; commercial structure fire; building collapse; motor vehicle accident; hazardous material incident), but also strategically determine which aims, tools, and actions will bring about a successful response that alleviates the hazards associated with an emergency. Imagine the rhetorical flexibility and technical knowledge it takes to "size up," "respond to," and "mitigate" an emergency involving just one of these systems?

As a scholar and teacher of rhetoric and technical communication who has spent over fifteen years in the fire service, I find myself continually exposed to, and in awe of, the rhetorical practices that firefighters utilize as technical communicators. Indeed, it is certain that a great deal of the time that I've spent in firehouses, at training academies, and on emergency scenes has been time spent learning, as Kenneth Burke (1969) put it, what it means to *identify* as a firefighter. In other words, through "acting together" in the collective pursuit and practice of the profession of firefighting, I have come to learn some of the "common sensations, concepts, images, ideas, [and] attitudes that make [firefighters] *consubstantial*" (Burke, 1969, pp. 20-21). For example, I've learned that salty firefighters love to present newly inducted members of the service with one well worn saying: "all you have to do is just put the wet-stuff on the red-stuff." A wonderfully

stoic understatement, it is a maxim that reflects an ideological pragmatism that underlies the fireservice. At best, this sense informs a *techné* that firefighters draw upon to make the types of prudent, levelheaded decisions that bring crises to a halt. "[A]n inventively systematic knowledge that aimed toward previously thought-out, but not pre-determined ends," Robert Johnson and Frances Ranney (2002) posited that "*techné* does its best work —thinking on its feet, creating and responding to crises of knowledge, and producing its own particular brand in the process" (p. 239). However, when taken too far, this sense of pragmatism easily lends itself to unmindful functionalism, inspiring a *techné* that Plato's Socrates would have considered a knack.

Unapologetically loyal to traditions, the firefighters with whom I've had the honor of working have made plain that theirs is a *blue collar techné* which honors pragmatism and embraces a subdued, but deeply pioneering, adaptivity. Firefighters regularly confront uncertain exigencies where risk is a factor and human consequences are significant, so it is no wonder that these technical communicators have inherited, adapted, and invented an array of tools, practices, and techniques that are rhetorically resilient. Whereas some aspects of emergency response necessitate that firefighters rely on tools, practices, and techniques which have become trusted through work-hardening, others require heuristic flexibility that empower firefighters to prevail when facing catastrophe. It is precisely that heuristic flexibility that leads me to suggest that firefighters possess knowledge of a *blue collar-techné* that enables them to rapidly adapt and tools, practices, techniques to rapidly construct knowledge, coordinate response efforts, and communicate information in dynamic environments that, by their very nature as emergencies, tend to obfuscate and complicate such aims. For example, fires produce smoke, which reduces

the visibility of the environments where firefighters work, making it difficult to identify other firefighters, victims, and even their own location in space; loud diesel engines of pumpers and chainsaws, tools which firefighters use to mitigate disasters, inhibit speaking and listening, making it difficult to communicate; interference and distortion caused by the use of portable radios can interrupt the transmission and reception of critical information.

I posit that the heuristic flexibility which enables firefighters to transition among an array of complex and intersecting multimodal literacies, tools, and genres in practice illuminates an underlying *blue collar techné* that complicates predominant views of knowledge work as a white-collar symbolic-analytic activity found in professional and technical communication, computers and composition, and rhetorical literacy studies. Following the work of mulitmodal theorists (e.g., Jewitt, 2009; Jewitt & Kress, 2003; Kress 2010; 2003; Kress & van Leeuwen, 2001; Prior, et al., 2007; Van Leeuwen, 2005; Wysocki, 2001; Wysocki & Johnson-Eilola, 1999; Wysocki, Johnson-Eilola, Selfe, & Sirc, 2004), I understand literacies as practices, bodies, technologies, and materials that have been culturally, socially, geographically, and economically organized into rich tapestries for making and communicating knowledge. Therefore, this chapter calls attention to a full range of tactile, kinesthetic, spatial, gestural, visual, and alphabetic genres that firefighter use to construct knowledge, coordinate work, and communicate information.

Following the work of Clay Spinuzzi, William Hart-Davidson, and March Zachry (2006)—I attend to both the *mediational* and *communicative* genres that firefighters

marshal as literacy practices for realizing epistemic and communicative ends.[11] Rendering these non-traditional literacies visible, I argue that firefighters "wor[k] *within* information, filtering, rearranging, transforming, and making connections to address specific, specialized problems" (Johnson-Eilola, p. 19). Or, in other words, I make a case for considering firefighters—and, the distinct literacies that comprise a *blue-collar technné* found in this profession—as symbolic-analytic workers (Johnson-Eilola, 2004; Reich, 1992). Indeed, my arguments here resonate with those of Cynthia Selfe (2009), who recently argued that the field of rhetoric and composition has been slow to take stock of the consequences associated with privileging normative conceptions of literacy: "our contemporary adherence to alphabetic-only composition constrains the semiotic efforts of individuals and groups who value multiple modalities of expression" (p. 616).

This chapter surrounds one observational period at AFDTF wherein firefighters participated in a company-level live-fire training evolution. In order to render the range of complexity associated with firefighters' multimodal literacies visible, I trace examples of the tactile, kinesthetic, spatial, gestural, and visual genres that firefighters used to construct knowledge, coordinate work, and communicate information during the drill. While I might have pulled exemplars of these genres from the larger pool of observational data, I chose to limit the view offered here to a single training evolution in order to demonstrate the rhetorical complexity associated with fireground activity that is

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[11] Mediation, as activity theorists like Spinuzzi, Hart-Davidson, and Zachry (2006) explained, translates exteriorized objects and interiorized knowledge, qualitatively changing the nature of a subject and the objective world in which s/she acts. Because both communicative and mediational genres help to carry out that work, both can be considered mediational, yet these authors argue that communicative genres (e.g., emails, dissertations, and license plates) differ from mediational genres (e.g., shopping lists, cognitive heuristics, mnemonics) because the latter are explicitly designed to perform transactional, intersubjective work (pp. 43-44).

relatively simple in comparison to an actual emergency scene where multiple companies and stakeholders (e.g., citizens, police, EMS, public works, utilities) might interface. Focusing on a single training evolution also offered an empirical frame that privileged the range of multimodal genres that the firefighters actually used. In other words, this approach emphasized an *applied* view of genre, as the genres discussed hereafter are those that were observed being used in practice. This specific data set was selected because it was the least complex training evolution of the six observational periods in three distinct ways: (1) this training evolution involved the fewest number of participants; (2) this training evolution was the shortest as it lasted approximately one hour; (3) and, during this training evolution, firefighters pursued the fewest number of learning/training objectives.

To avoid a structuralist account of the multimodal literacies in this chapter—an account that emphasizes meaning as essentially located within a logic, grammar, and/or affordance of a specific mode and/or modal configuration—I have made use of cultural-historical activity theory (CHAT). It is a considerably useful framework for sketching the ways that multimodal literacies are used by firefighters because it understands these as situated rhetorical practices through which activity systems are constructed, maintained, and adapted over time. As Paul Prior et al. (2007) asserted, CHAT offers a view of multimodality that attends to the "material ecologies" through which literacy practices are realized (para. 2). This chapter makes use of that framework[12] in order to enact a

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[12] As Elmar Hashimov and Brian McNely (2012) cogently explained, "[a]ctivity theory provides a descriptive framework that takes into consideration the entire activity (comprised of sometimes discrete and often overlapping actions and operations) and accounts for the subject (the person or persons conducting the activity); the activity object or objective (what the motivated actions are aimed to achieve); the socio-cultural context; and the numerous tools used to jointly mediate individual actions " (p. 253).

descriptive analysis that is responsive to the ways these multimodal literacies were deployed in practice. That is, after all, what CHAT does best: as Bonnie Nardi (1996) explained, "[CHAT] is a powerful and clarifying descriptive tool rather than a strongly predictive theory" (p. 4). In order to prioritize and draw attention to the ways firefighters' multimodal literacies are rooted in larger ecologies of practice, then, the descriptive account offered in this chapter is theoretically sensitive to, but does not directly make mention of concepts—*subject*, *mediational means, object/ives, rules, community,* and/or *division of labor*—that Yrgö Engström (1987) offered for describing activity. Instead, this chapter privileges terms native to this activity system in order to familiarize audiences to this discourse unique to this community. Specifically, as the chapter unfolds, I critically attend to (1) outlining different ranks of participants (subject), (2) describing the tools, including the multimodal genres, firefighters use to carry out work (mediational means), (3) explaining the goals that firefighters pursue (object/ives), (4) accentuating the ways that standard operating policies, national standards, and tacit expectations govern work (rules) (5) illustrating the way work is distributed across units responsible for specific tasks (division of labor), and (6) reporting on how larger communities influence the ways that work is performed. My rationale for doing so is three-fold.

Foremost, I have attempted to offer audiences an insider's glimpse into firefighting with the aim of facilitating a level of access that is necessary for a critical discussion of these multimodal literacy practices. As scholars in social semiotics (Kress, 2003; Kress and van Leeuwen, 1996; 2001; van Leeuwen, 2008), social linguistics and new literacy studies (Gee, 1996; 2004; 2007; Street, 1994) critical discourse analysis (Fairghclough, 1989; 1992; Van Dijk, 1995; 1996) and rhetoric and composition (Grabill,

2003; Grabill & Simmons, 1998; Huckin, Andrus, Clary-Lemon, 2012; Porter et al., 2000) have posited, discourses—including literacy practices through which they are enacted—are tied to issues of access. Teun A. van Dijk (1996), for instance, asserted that "[p]atterns and strategies of discursive access may be spelled out for virtually all social domains, institutions, professions, situations and genres" (p. 86). In other words, discourses are powerful boundary maintenance tools that not only keep outsiders at bay but also provide insiders with a unifying sense of identity. While it is, perhaps, impossible to position readers as insiders, I want to draw attention to three components of this activity system that I have specifically attempted to foreground in my descriptions of firefighting:

> (1) I draw attention to the ways that work activities are divided and assigned to individuals of different ranks, but who work as part of collective operational units;
>
> (2) I draw attention to distinct but interrelated object/ives firefighter pursue as individuals who are a part of a larger collective acting in coordination;
>
> (3) I draw attention to the types of multimodal genres firefighters have organized to form literacy practices that have dense complexes with embodied, analog, and digital elements.

Second, it is my aim to emphasize the ways in which literacies are situated within wider ecologies of practice. As Bonnie Nardi (1996) contended, "consciousness is located in everyday practice: you are what you do. And what you do is inextricably embedded within the social matrix of which every person is an organic part" (p. 7). CHAT offers a systematic or ecological view of literacy that tracks well with Gunther Kress and Theo

van Leeuwen's (2001) realization that research surrounding multimodality must attend to practice in order to avoid structuralist accounts of language and meaning making:

> It was not until we began to incorporate the ideas of *practice* more fully, until we moved from the idea of 'the language of multimedia' to the idea of 'communication', and from questions like 'what is a mode' to questions like 'how do people use the variety of semiotic resources to make signs in concrete social contexts', that we began to see some light at the end of the tunnel. (p. vii)

Indeed, many multimodal accounts of literacy tend to focus more on *modality* than *practice,* which is a very limiting approach. In contrast, Prior et al. (2007), Russell (1995), and Nardi (1996) have demonstrated CHAT is empirically sensitive to the interrelationships between multimodal genres, subjects who produce and utilize them, and the aims they hope to accomplish. Subsequently, this theoretical frame offers a critical lens through which researchers can avoid overemphasis of a single subject, tool (mode, medium, genre), or object/ive within a spectrum of activity.

Last, this chapter provides scaffolding that accommodates the WAGR analysis that I undertake in the chapters that follow. By first taking stock of the multimodal genres firefighters used to pursue different literacy aims, it is possible to elucidate deeper insights about how literacies, multimodality, and genre are co-constituted within the practice of human activities. Ultimately, I argue that pairing multimodality with CHAT is methodologically useful for rendering visible the ways that embodied, analog, and digital literacies can co-compete within larger ecologies of practice. Within the confines of this study, combining CHAT and multimodality has helped to reveal how tacit knowledge becomes materially and/or cognitively operationalized within the tools, practices, and

techniques firefighters use often performing social-epistemic functions in silent, yet dynamic ways. Again, as Russell (1995) maintained, "one must always remember that...activity systems and their tools—including genres—are always in dialectical change" (p. 57). So, don your personal protective equipment (PPE) and button up, because it's about to get hot.

Size-Up: Engine 14 and Special Hazards 2 of Orderville Fire Department are on scene at AFDTF to practice fire-suppression and search and rescue techniques

Following a report of an emergency, the first unit to arrive on scene is responsible for conducting a *size-up*. A size-up is a brief situational report (oral-analog; oral-digital) that chief officers, line officers, and/or senior firefighters will broadcast over the radio to inform incoming units and dispatch of the status, nature, type, and severity of the emergency they are responding to. If a chief were to arrive on scene at fire within a building, for example, s/he would read the building and then key his/her portable and/or car radio and say something like "Chief 4, on-scene, 41 High Street, reporting a working structure fire, four-story masonry construction, occupants do not appear to be evacuated, heavy fire showing first and second floor, side D" (visual-embodied; spatial-analog-embodied; oral-analog; oral-digital).[13] This genre performs an important rhetorical function because it contains information that enables incoming units to make informed decisions about which tools and tactics they might need to perform tasks that they might anticipate being assigned by an Incident Commander (IC) once they arrive on scene (oral embodied; oral-digital; oral-analog). In the case of the training evolution that this chapter

[13] I'll shortly explain the way that space is discussed on firegrounds, including the ways that sides a, b, c, and d are assigned.

surrounds, I have remixed this genre in order to provide background information that introduces audiences to the Alliance Fire District (AFD).

Depending on whom you ask, either eight or nine volunteer fire departments comprise the AFD, a para-municipality responsible for public safety in a large town in Southeastern New England. This is because one of the nine stations—Kromley Fire Department, Station Six—operates under its own jurisdiction, according to its own standard operating guidelines (SOGs), and serves a separate tax district. Official training drills are held weekly at the Alliance Fire District Training Facility (AFDTF) on Wednesday evenings at 1630 hours and Sunday mornings at 0800. Departmental trainings that will be held at AFDTF are organized and scheduled during the Joint Training Committee (JTC), a monthly meeting of line and chief officers[14] responsible for training within AFD/KFD (oral-embodied) and posted on a calendar that hangs on the wall outside of a classroom within at the AFD administrative headquarters (alpha-numeric-temporal-analog).

On Monday, October 1, 2012 Deputy Chief (Dc.) Kavanagh, the chief officer who is assigned operational responsibility for all training at AFDTF—but who answers to Chief Farrelly—called and invited me to observe a small-scale training drill that Orderville Fire Department (OFD), Station One, had scheduled for the evening of Wednesday, October 3 (oral-digital). He explained that firefighters from Engine 14 (E-14) and OFD Special Hazards 2 (SH-2), the two companies that comprise the Orderville Fire Department (OFD) would be conducting live fire training drills and suggested that it

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[14] Line officers are firefighters who hold the rank of Lieutenant or Captain. Generally speaking, line officers are responsible for ensuring that department activities are enacted according to the policies and procedures set forth by Chief Officers who hold the rank of Chief, Assistant Chief, Deputy Chief, or Battalion Chief.

would be a good opportunity for me to observe a small-scale training drill. The specific goal of the training drill was for E-14 and SH-2 to practice search and rescue and fire suppression techniques within realistic, controlled fire conditions at the AFDTF's live-fire training structure.[15] Prior to this invitation, I had only been offered observational access to the training evolutions of outside departments unaffiliated with the AFD who had paid to visit the facility. Excited to see how AFD trains its own members, I took Dc. Kavanagh up on the offer.

Arriving early at 1800 hours, I prepared the digital recording tools I would use for observation while waiting for Dc. Kavanagh to arrive. I placed two double-A batteries and a two-gigabyte memory card into each of the two high-heat cameras that would be used to visually and audio capture activities that would take place within the structure. Direct current (DC) from my truck's battery traveled to a *GoPro Hero2*™ , charging the high-definition camera that I would use to capture exterior video and audio on a thirty-gigabyte memory card. I took out the two digital audio recorders that I would use to capture audio and tested each of the devices. Plugged into a separate DC outlet was a charging base that held a nickel-cadmium battery for the thermal imaging camera (TIC). This device has a display screen which allows viewers to see the thermal signatures in a surrounding environment. Mounted to the TIC was a transmitter I had borrowed from a neighboring department. The transmitter would enable the TIC to broadcast an analog signal to an receiver which was connected to a analog to digital converter I had found that

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[15] In *NFPA 1403: Standard on Live Fire Training Evolutions* (2012), The National Fire Protection Agency (NFPA) provided a classification of, and standard operating procedures appropriate to, the three types of live-fire training facilities which include (1) acquired structures (pp. 9-10), (2) gas-fired live fire training structures (pp. 10), and (3) non-gas-fired live fire training structures. UFDTF is a non-gas-fire live-fire training structure, and uses Class-A fuel materials (e.g., wood, hay, and straw), as defined in 4.12 "Fuel Materials" (pp. 7-8).

would allow me to video-record the thermal signatures on a MacBook using iMovie. Once the observational equipment was arranged and tested, I began to visually inspect my own firefighting equipment. Dc. Kavanagh arrived at the AFDTF just before 1830. He greeted me and brought me inside to help him gather hand-tools, portable radios, and self-contained breathing apparatus (SCBA) from an equipment cage. We would need this equipment in order to participate in the training activities that OFD had prepared. While we were gathering equipment, E-14 and SH-2 arrived at the AFDTF and staged on the lower tarmac that surrounds the live-fire training structure.

Developing situational awareness: Preparing for the drill to go live

Firefighters use a variety of multimodal literacy practices, including a range of spatial genres that enables them to collectively orient one another in space so that they may effectively talk about locations and structures that they may not have first hand experience with. For example, the vertical, street-side or front-door view of a structure is uniformly referred to as *side-A* (See Figure 3.1: Structural identification by side). The ensuing terms for the spatial coordinates are then assigned by moving clockwise around a structure beginning from *side-A*: *side-B* is the left side of the structure, *side-C* is the rear, and *side-D* is the right. If viewed from *side-A,* the live-fire training structure at AFDTF stands as a two-story building. If viewed from *side-C*, however, a walkout basement gives

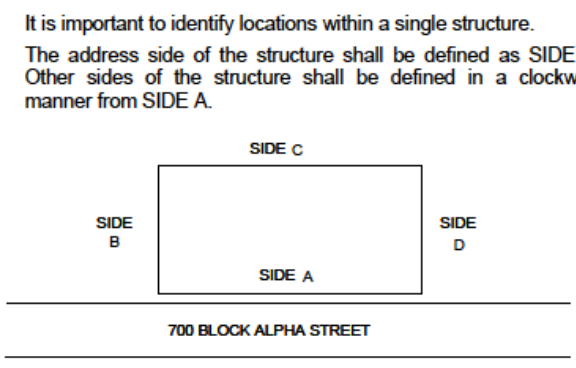

Figure 3.1: Structural identification by side (FEMA, 2006, pp. 4-5)

the illusion that the structure is a three-story building. Because discrepancies in spatial knowledge are a common source of confusion and/or miscommunication, firefighters are taught to perform a *walk-around* or *360* when they immediately arrive on an emergency scene (kinesthetic-visual-embodied). Thereafter, firefighters are expected to follow an internalized knowledge of the guidelines which Incident Command System (ICS)/ National Incident Management System (NIMS) has provided so that first-responders can talk about structures and locations with confidence.[16] According to ICS the term *division* "[is] used to divide an incident into geographical areas of operation" (no pag.). When applied to structures, ICS specifies that the term *division one* should be uniformly assigned to the geographical area of the ground-floor of a structure; *division two* is uniformly assigned to the floor directly above and so on continuing upward. Subterranean floors follow a similar mode but are termed *subdivisions*. Because residential structures tend to only have one subterranean floor, *subdivision 1,* and because in practice firefighters tend to interpret and apply ICS in unique ways, *subdivision 1* is more commonly (and, simply) referred to as the *basement division* or *basement*.

Another type of genre that firefighters use involves reading the architectural features of a building in order to determine the common layout of floor plans for that type of structure (visual-spatial-embodied). The burn-building at AFDTF is a Cape Cod, a type of residential construction common within Southern New England. Consistent with the architectural layout of a Cape, two independent stairwells are positioned directly in the

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[16] NIMS/ICS does more than simply provide a consistent framework for understanding and discussing space. NIMS/ICS was constructed as a framework for facilitating interagency response to emergencies which requires stakeholders from police departments, fire departments, emergency medical services, federal agencies, and utilities companies to be able to speak a consistent language, coordinate work efforts, and prioritize jurisdictional responsibilities.

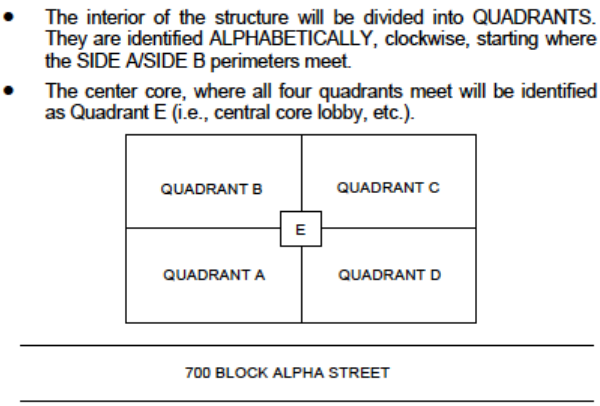

Figure 3.2: Structural identification by quadrant (FEMA, 2006, pp. 4-5)

center of the structure. Each stairwell ascends vertically from *side-A* through *quadrant-E* toward *side-C*. Therefore two separate stairwells connect the *basement division* to *division one*, *division one* to *division two* (See Figure 3.2: Structural identification by quadrant). While firefighters utilize visual features of the building to determine the type of architecture, they must have an internalized spatial knowledge of types of building construction in order to know how fire will travel within different types of structures as fires progress (visual-spatial-embodied). For example, many Cape Cods in New England were built using balloon-frame construction, a framing method that was common up until the 1960s.

Knowledge of balloon-frame construction is especially crucial for firefighters to understand because the vertical framing members stretch from the basement to the attic which means that there are void spaces between the interior and exterior walls of such buildings (spatial-architectural-visual-embodied). This allows fire to travel unimpeded between the walls from the basement to an attic with no visible flame in rooms and open spaces between floors and walls. In such cases, fire may appear to be isolated on one division such as the attic, but in actually is spreading within the walls and/or may even be located in subordinate floors such as the basement. Firefighters unaware of the presence hidden in void spaces may be working in locations of the building that are structurally compromised and pose a collapse hazard, as occurred on April 14, 2012 in the Bronx,

NY when two FDNY firefighters "fell through a collapsing floor" (McGeehan & Pereira, 2012). Because this type of construction poses a significant risk to firefighters who work in the AFD, Chief Farrelly ensured that the building committee responsible for oversight of the training facility when it was being planned understood that including a simulator which mimics the fire behavior of balloon-frame homes was included in the design of the burn building at the AFDTF. Located in a hidden void space on the D-side of the training structure, the balloon-frame simulator can be accessed by opening heavy iron doors.

Beyond the spatial and architectural literacies that firefighters utilize, traditional alpha-numeric literacies are also important. Indeed, much of the work that firefighter perform is highly regulated because there are consequential risks associated with this inherently dangerous profession. Just like the Department of Homeland Security provided NIMS/ICS, a heuristic framework for coordinating interagency response, organizations such as the National Fire Protection Agency (NFPA) promulgate national standards that prescribe many aspects of how work within U.S. fire departments should be carried out. While these mediating documents are often not present on emergency scenes—it would be counterintuitive for a fire chief to arrive at an emergency scene only to pull out a manual and read about how to respond to a specific emergency for an hour before taking action—they do have a powerful impact on how work is performed (textual-alphabetic-analog/digital; cognitive-embodied).

From an operational standpoint, the training evolutions that have been planned for the training planned at AFDTF tonight adhere to a variety of these standards. For example, *NFPA 1403: Standard on Live Fire Training Evolutions* (2012) has specified procedures for how live-fire training must be conducted and *NFPA 1851: Standard on*

Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting (2014) has explained the types of PPE firefighters must wear, how it should be worn and maintained, and even when it should be replaced. Following *NFPA 1403*, Lieutenants Brodrick and Lamb have planned two live-fire evolutions for members of E-14 and SH-2 to participate in this evening. Note that while these documents weren't physically present during the training evolutions, they had a powerful shaping force on the way that the exercises were carried out. For instance, instructional staff at the training (including myself) were so familiar with the functional operational assignments specified by *NFPA 1403* that they organically assumed responsibilities with little discussion. Whereas Lieutenant (Lt.) Lamb assumed the operational role of instructor-in-charge, exterior safety, and acted as Incident Commander (IC) for the teams participating in the evolution, Dc. Kavanagh assumed the role of safety officer (SO). Whereas Ff. Ennis and myself comprised the fire control team (FCT), Ff. Ennis took the added responsibility of serving as the ignition officer (IO). Dc. Kavanagh and I also assumed responsibility for acting as members of the rapid intervention crew (RIC), a team that would promptly remove a firefighter from the training structure if an emergency occured during the evolution. Lt. Brodrick functioned as the instructor responsible for directly overseeing and delivering the instruction to the firefighters participating in the training drills as students.

During each of these evolutions crews will pursue two training objectives: (1) practice and/or learn techniques for fire-suppression which include locating the seat of fire, safely advancing hoselines to the fire, and applying the correct type of fire-streams to

extinguish the fire[17]; (2) practice and/or learn search and rescue techniques which include following search patterns that firefighters use to locate victims—life size dummies weighing nearly 200 pounds that resemble crash-test dummies—trapped in fires and safely removing victims to an area of refuge. Combustible material for the first live-fire training evolution, three palates stuffed with damp hay, are stacked atop of a steel rack that abuts the *side-B* interior wall of *quadrant-A*, *basement division*. Combustible material for the second live-fire training evolution is positioned on top of a second burn rack along the *side-D* interior wall of *quadrant-D*, *basement division*. A small pile of dry straw sits in the lower shelf of each burn-rack. As depicted in "Figure 3.3: View of AFDTF live-burn training structure from side-C", carbon deposits have assumed a pronounced triangular shape above the *basement division* windows where smoke has pushed its way out of the building. A rounded, off-center stain is visible above the *side-C*, *basement division* door. The stains above these *basement division* openings are the most well defined, suggesting that training fires are more frequently positioned on this floor. In comparison, carbon staining above the four windows of *division one* decreases in prominence moving from *side-B* toward *side-D*. Extending upward moving inward from the *side-B* and *side-D* gables, a single dormer with two faintly-stained windows rises from an uniform ridge-line. Climbing the entire length of the *side-B* gable, a chimney interrupts the night sky. Inside Dc. Kavanagh, Firefighter (Ff.) Ennis, and I making final preparations for the first training evolution to begin. Outside five firefighters are gathered in a circle: Lt. Brodrick stands near a position of eleven o'clock with Probationary Firefighter (Pff.) Kehoe (two o'clock), Pff. McGarrah (five o'clock), Firefighter (Ff.)

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[17] Just like the types of different nozzles that can be deployed on garden hoses, firefighters make use of nozzles that offer a variable set of firestreams that have different effects on fire when applied.

Figure 3.3: View of AFDTF live-burn training structure from *side-C* (PD-A, 00:05:14).
Here a group of firefighters wait as an interior team makes final preparations before the drill begins.

Figure 3.4: Close-up of probationary firefighter shields (WA-1).

Linn (seven o'clock) and Ff. Larimore (nine-o'clock) facing him.

The PPE that the firefighters are wearing demonstrate signifying practices that firefighters utilize to designate distinctions such as rank, experience, operational assignment, and departmental affiliation. For instance, the helmets that probies (probationary firefighters) Pff. Kehoe and Pff. McGarrah, wear are blue and have red shields and a blue letter "P" centered (See Figure 3.4: Close-up view of probationary firefighter shields). In relation, Ff. Linn and Ff. Larimore wear black helmets with black shields which have a white "14" centered. Traditionally, a white number surrounded by a black inlet on a black-shield symbolizes that a firefighter (rank) is assigned to an engine company, one type of common operational unit within the fire service. Conversely, a white "2" surrounded by a red inlet on a black shield would symbolize that a private—a term that refers to the rank of a basic firefighter—is assigned to a ladder company. Those ranking Lieutenant and/or Captain would wear white shields that have either black numbers (for engine companies) or red numbers (for truck companies) corresponding to their operational unit. Generally, those ranking Deputy Chief, Assistant Chief, Battalion Chief, and Chief or Chief of the Department wear white helmets with ornate hand-painted gold-leaf shields. With the exception of Pff. Kehoe who wears black pants with yellow trim, all of the five

firefighters gathered outside wear tan gear with orange reflective striping, the standard color scheme for AFD turnout gear (alpha-numeric-color-visual-analog).[18] "Figure 3.5: Visualization of genres and modes" provides a visualization of the interrelationships between the modalities and genres described up to this point in the chapter. Note that while there is a wide diversity in modes represented in this section, the predominant genres that have appeared thus far have been cognitive, alphanumeric, and visual.

Permission to light granted: Evolution one begins

Members SH-2 and E-14 are in place outside the structure. Our pre-training safety briefing has been completed. Ff. Ennis, Dc. Kavanagh, and I await permission to light the fire. Inside, I watch as Ff. Ennis, who is standing in *quadrant-A*, adjusts the straps to his self-contained breathing apparatus (SCBA). The SCBA cylinder contains 4500 psi of compressed air that will enable him breathe when smoke, heat, and fire begin to fill the basement during the first training evolution. The walls and ceiling of the basement are coated with refractory cement and tiles which reflect heat back toward the floor and open-space of the rooms. This protects the concrete and the rebar that carries the weight of the burn building. Dc. Kavanagh and I begin putting on the face-pieces to our SCBA, I pull the straps that pull the mask tight to my clean-shaven face so that I can get a tight seal, and then pull the flash-hood I am wearing up over its edges. Next I place my helmet on my head, adjust the ratchet-strap to get a snug fit, and click the chin-strap into place

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[18] There are four common divisions of labor in the U.S. fire service: (1) engine companies, (2) truck companies, (3) technical rescue and/or special hazards companies, and (4) emergency medical services. Operationally, engine companies are responsible for water supply and water suppression; truck companies perform ventilation, forcible entry, ladder operations, and search and rescue; technical rescue/hazards companies are responsible for hazardous materials, vehicle rescue, heavy rescue, trench, high-angle, water and swift-water rescue; emergency medical services are responsible for patient care, medical monitoring, and firefighter rehabilitation.

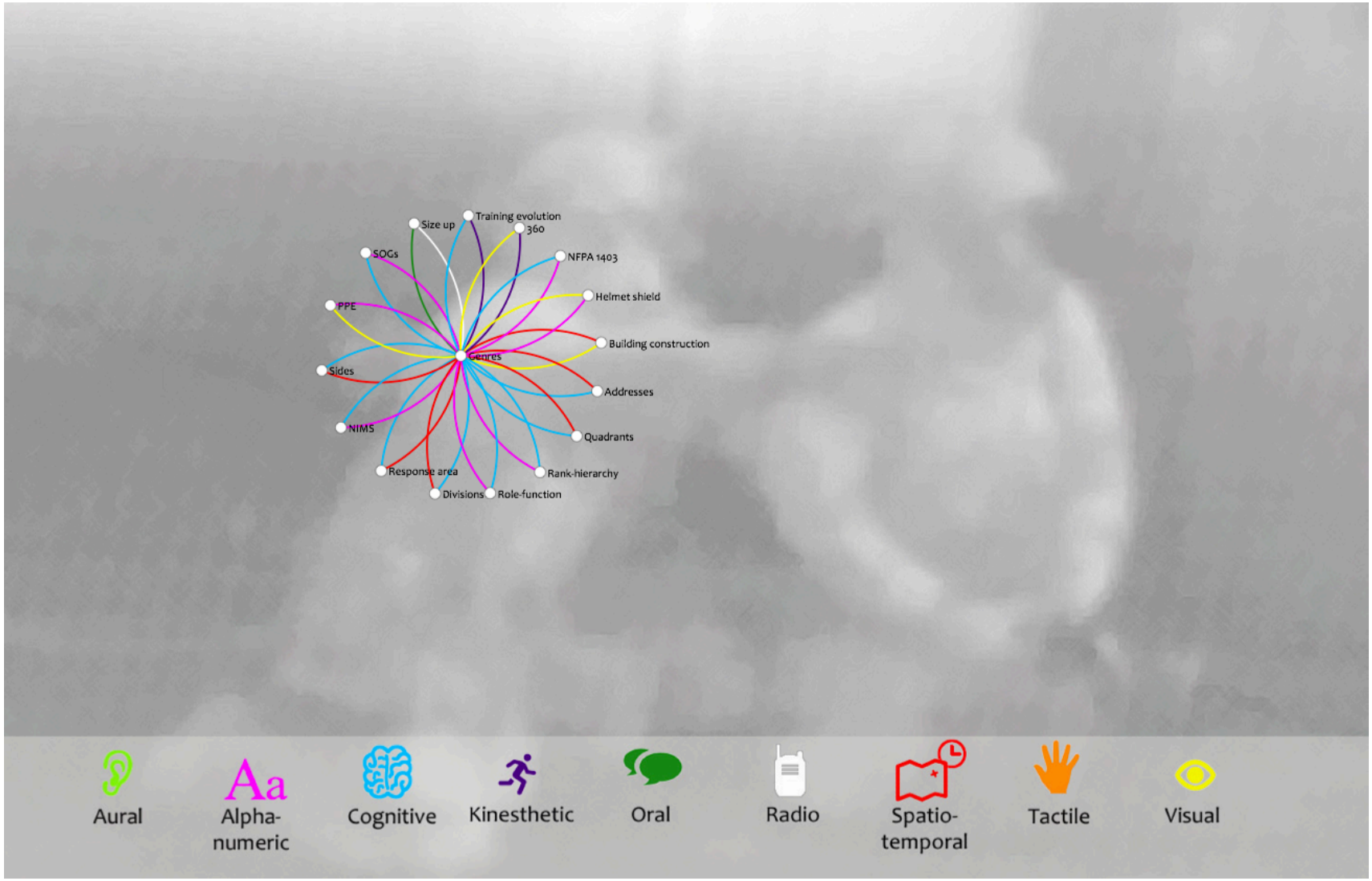

Figure 3.5: Visualization of genres and modes

(dress-kinesthetic-tactile-embodied-analog).

While wearing PPE properly is one of the most mundane tasks firefighters perform, it is also the first skill that firefighters must master. The three of us are now wearing a full-protective ensemble of PPE that also includes our turnout coat and pants, boots, gloves, and SCBA. Over the past 30 years, PPE has become increasingly sophisticated and components are consistently added and/or improved. For example, fifteen years ago, flash-hoods were a new addition to PPE, but today they are *almost* universally required. Before this piece of safety-equipment became prevalent, firefighters used their ear lobes as a safety indicator: when their ear lobes began to burn, firefighters knew it was no longer safe to be inside a structure and they would exit immediately (tactile-embodied). While flash-hoods protect firefighters from burns to the neck and ears, the introduction of this piece of safety-clothing robs firefighters of a valuable form of sensory knowledge. Consequently, it is not uncommon for firefighters to conveniently "forget" to wear this piece of protective-clothing, and at least one fire department in a large New England city does not issue flash-hoods to firefighters, presumably so that their firefighters can still use this method.

00:05:38 Dc. Kavanagh opens the valve to the 4500 psi cylinder in his SCBA. Air flows through the high-pressure line to the high-pressure regulator where pressure is reduced. Air flows into the low-pressure line and to the regulator assembly. The pressure slowly builds in the regulator. At 100 psi, the integrated end of service time indictor (ETOSI) begins to emit a rhythmic, pneumatic vibration. The plastic guttural sound stops, an indicator that the pressure has surpassed 1125psi (1/4 of the cylinder) where the ETOSI is set to alarm. SCOTT, the manufacturer of the SCBA equipment, has engineered the pack to function according to *NFPA 1981 Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services* (2007).

Dc. Kavanagh turns his SCBA on; I hear a series of beeps from the integrated Personal Alert Safety System (PASS) that has automatically activated because air from the SCBA cylinder has entered the SCBA system. The PASS is a device on the SCBA that allows firefighters to press a button which activates a high-pitch aural alarm and rapid blinking of lights which are positioned on the SCBA in case of a mayday situation (kinesthetic-aural-visual-analog). It also has a safety feature that is automatically activated so that firefighters who become incapacitated and cannot move can still be located: once a SCBA is activated, if a firefighter fails to move for a period of 30 seconds, a series of warning chirps sound and lights blink, growing progressively louder and/or more rapid until the PASS transitions into full alarm (kinesthetic-aural-visual-analog).

00:05:40	The pressure activates an integrated PASS device. An sequence of three dull beeps sound: *dut-dut-dut*. They echo within the concrete basement.
00:05:40	I inform Dc. Kavanagh and Ff. Ennis that I am dressed out and prepared for the evolution to begin.
00:05:41- 00:05:43	Dc. Kavanagh instructs me to close a window on side-B, in quadrant-B.
00:05:46	Dc. Kavanagh instructs Ff. Ennis to get permission to light the fire.
00:05:50	Pff. McGarrah shakes his hips from side to side to prevent the PASS device from activating from non-movement. A sensor that detects his motion is located within the harness in the region of the lower back.
00:05:52- 00:05:54	Ff. Ennis keys the lapel mic to a 400 mega-hertz portable radio. As Ff. depresses the button to activate the microphone, an aural chime sounds briefly, indicating that he has successfully opened the circuit. The chime ends, Ff. Ennis speaks: “Command from fire-starter, permission to light.”
00:05:53	Dc. Kavanagh begins to close shutters for quadrant-B, side-C window. Lt. Brodrick notices and begins to walks toward window to help, but changes course to shut the basement division door instead.
00:05:53	The beam of a flash-light shines out of a side-B window, illuminating the asphalt.

00:05:57	Lt. Lamb: “Stand by”
00:05:58- 00:06:00	Hinges creak and steel rattles as shutters meet the concrete window sills. The aural chime of a portable radio being keyed up sounds: no readable message is transmitted.

Outside Lt. Lamb makes final safety preparations to the exterior of the structure. An uncharged 1 3/4” pre-connected Mattydale hand-line has been stretched from E-14 to *side-C* of the structure. Lt. Brodrick and the four trainees are gathered in a circle. Ff. Linn holds a roof hook; Ff. Larimore holds a flat-head axe. A Halligan tool rests on the deck outside of the entrance beside the group.[19] Lt. Lamb puts the truck in pump and charges the hand-line, supplying water to the nozzle. As water pressure builds within the hose-line, the line expands causing the unmanned nozzle to gently flip over. Pff. McGarrah watches the line pressurize. Lt. Brodrick gestures toward the structure, possibly explaining the training evolutions that are about to begin. When he notices that the line has been charged, he walks toward the nozzle. Ff. Larimore follows. Placing the flat-head axe down, he picks up the fog-nozzle, points it away from the structure and personnel, kneels over the line to stabilize it, and cracks the bale to bleed the air from the line. The stream spits, as it forces air out of the line.

Inside, a thick coat of ebony, soot particles which cling to the walls and ceiling of the basement, have formed a horizontal knee-high line circling the entire length of the space. The line visually indicates that a *neutral plane* formed during a previous training evolution, and serves as a reminder that the heat within this training facility is real.

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[19] Within the fire service, tools and techniques are often named after the firefighter and/or department that is credited for their development. For instance, the “Mattydale” is not actually a type of hoseline, but a way of folding the hoseline to fit within a hosebed so that firefighters can quickly stretch a line from the pumper to the location of the fire (Wilmoth, 2010). Similarly, a roof hook is also known as a New York hook or Farrell hook after it’s creator, Captain Robert Farrell, Ladder 31, FDNY (Colarusso, n.d.); a Halligan tool is named after First Deputy Chief Hugh Halligan, FDNY (Hashagen, 2002).

Indeed, the line shows that the *thermal layering* which had occurred as "gases form[ed] into layers according to temperature" during a previous evolution had pushed the cooler air to the floor (IFSTA, 200—8, p. 117). Firefighters are taught to crawl to avoid exposure to fire, smoke, and the highest temperatures when entering structure for precisely this reason (kinesthetic-tactile-embodied-visual): as fires intensify, progressing through the four stages of growth "*incipient*, *growth*, *fully developed*, and *decay,*" products of combustion rise before filling compartments horizontally and beginning to bank down (emphasis original; IFSTA, p. 113). Lt. Lamb (IC), who is running operations for the drill, gives Ff. Ennis (IO) the order to ignite the straw located in lower shelf of the burn-rack (oral-analog). Ff. Ennis grabs a butane torch which rests on the floor next to his right foot.

00:06:30	Ff. Ennis plugs his regulator into the SCBA facepiece. The sound of air filling the mask can be heard, as he articulates the purge valve to defog mask allowing cold air to run across the surface of the plastic that has formed condensation from his breath building on it.
00:07:19	Lt. Lamb: "Fire-starter go ahead and light."
00:07:28-00:07:29	Ff. Ennis keys mic, heavy feedback can be heard due to the proximity and volume of other radios in the room. Using a thermal imaging camera (TIC) Ff. Ennis visually observes the ambient temperature in the room. He reports his findings to Lt. Lamb [radio transmission]: "10-4, we have a reading of 70 degrees at the ceiling and 70 degrees at the floor."
00:07:33	*Cah-chaaa-sssshhh*: A regulator is plugged into a SCBA face-piece the sound of positive-pressure filling the mask with air can be heard as one of us takes a breath.
00:07:34	Lt. Lamb [radio transmission]: "10-4, 70 degrees and 70 degrees."
00:07:48	Ff. Ennis confers with Dc. Kavanagh and I to ensure that we are ready for him to light the fire.
00:07:58	Ff. Ennis uses the torch to light the straw located on the rack.

00:07:58-00:08:10	The sound of Dc. Kavanagh and I breathing through our SCBAs can be heard.
00:08:12	A fleeting and muffled snap can be heard as the heat increases.
00:08:13	Dc. Kavanagh: “Let him know the fire’s lit.”
00:08:21	I key my radio up, heavy feedback, as Dc. Kavanagh’s radio is in close proximity to my microphone.

Ff. Ennis lights the material with the torch, and fire begins to spread from the straw to the larger stack of combustible materials on the rack. The fire intensifies, superheated gases and incomplete products of combustion travel outwards away from the burn rack. Flames start to roll across the ceiling through the toxic smoke and gases. Toxic smoke and gases and deadly heat fill the training structure, making it an environment immediately dangerous to life and health (IDLH). Compartment pressure builds as smoke, heat, and gases fill the space: below the neutral plane oxygen and cooler gases are pulled inwards through the gaps in windows and doors, as the fire searches for an increasing supply of oxygen to consume; above the neutral plane smoke lazily pushes its way out through gaps and ventilation holes.

“Figure 3.6: Thermal layering” demonstrates how thermal layering appears above, at, and below the *neutral plane*. Three images taken within eight seconds of one another have been assembled and stacked vertically using photo-editing software. The top image depicts a view above the neutral plane at approximately six feet off the floor. Smoke has reduced visibility so much that only a small bit of reflective trim and a faint glow of fire can be seen (WG248, 00:07:57). The center image depicts a view of the *neutral plane* itself at approximately five feet above the floor (WG248, 00:07:53). The bottom image taken at a location approximately four-feet off the ground demonstrates that below the

Figure 3.6: Thermal layering (WG248, 00:07:57; WG248, 00:07:53; WG248, 00:07:49).

neutral plane visibility is nearly unimpeded (WG248, 00:07:49).

Hovering illuminated, carbon particles enjoy a lazy waltz, as an errant flashlight beam spills into the basement. Except for the fire, the room is otherwise entirely devoid of light. It is an empty darkness, lonely yet calming. In the corner, the blistering flames devour a set of hay stuffed wooden palettes which mutter in a quiet, steady chant of snaps and crackles—pops. As pockets of superheated gases touch off, a wispy walk of flaming fingers tumble across the ceiling, grasping, glowing, undulating. My arms and shoulders warm: the thermal layer of my turnout coat is becoming saturated, absorbing the radiant and convective heat that wafts outward from the fire (tactile).

00:08:21 A single chirp sounds from either Dc. Kavanagh's or my SCBA indicating that the batteries are low and need to be changed. I do not transmit a message because of the feedback. Instead, I try to move away from Dc. Kavanagh so that I can successfully get a message out.

00:08:23- 00:08:24	I key up for a second attempt. Again there is heavy feedback. When more than one radio occupies a space, all firefighters must dialing radio volume back to half-way in order to prevent this type of feedback from impending communications [radio transmission]: “Fire’s lit.”
00:08:38- 00:08:40	Ff. Ennis attempts a second try to communicate out to command that the fire is lit: [radio transmission]: lighter feedback, “Command, copy: Fire’s lit.”
00:08:42- 00:08:44	Lt. Lamb walks away from the group of firefighters in-order to avoid feedback himself, keys mic [radio transmission]: “I’m getting feedback out here.”
00:08:53	A radio keys up inside. No message transmitted.
00:09:02- 00:09:03	Lt. Lamb [radio transmission]: “Interior let me know when you’re ready, I’ll send ‘em in.”
00:09:15	Ff. Ennis reaches out the door. He places the torch along the exterior wall of *side-C*.
00:09:22	Ff. Ennis keys mic, heavy feedback continues to interfere with radio communications, attempts another message that is unintelligible [radio transmission]: “Command from fire starter, fire is lit.”
00:09:24- 00:09:29	I ask Dc. Kavanagh if his radio is working properly.

Pores issue forth beads of perspiration which convene to form brief pools before trickling down my face (tactile). Pressure and friction build within the regulator assembly—a nondescript, faint hum resonates, as I slowly inhale through my nose with deliberate purpose. A rain shower of salty, smoky drops of sweat erupt from the blast of compressed air that fills my SCBA mask *scchhhhkkkuuhhg- sssssstttttt*, Darth Vader’s iron lung. My eyes sting, briefly. I grimace and squinch to relieve a tickling irritation in my nose. I hold the breath, listening: thud, the heavy punch of a contraction pushes a swell of oxygenated blood through the left ventricle. First, in my neck—the common carotid artery—then, in the external carotid artery, my chest cavity calls cadence for my body. I continue to hold

the breath, redirecting my ear's attention outward—away from myself. I place the hubbub of my body and equipment on mute (embodied-aural).

00:10:00- 00:10:09	Ff. Ennis keys his mic, again, feedback [radio transmission]: "Command we have 300 at the floor and 450 at the ceiling
00:10:15	Lt. Lamb [radio transmission]: "Received."
00:10:27	Dc. Kavanagh: "Hey Tim, come here."

Outside of the structure I hear a bit a shuffling, a muffled chorus of indistinct voices, the steady rumble of the diesel engine of a fire engine. Ff. Ennis passes beside me simultaneously delivering a pointing wave and a spoken message that cannot be made clear (kinesthetic-visual-oral). The face-piece he wears renders his voice a stifled mumble —*wuh-wah-wuh-wah-wuh*, Charlie Brown's teacher. Dc. Kavanagh's radio volume is set to high.

00:10:29	Dc.. Kavanagh is just over arms length away from me, but I cannot see him because the thick smoke has limited visibility. Me: "Chief, where are you?"
00: 10:30	Ff. Ennis keys mic, heavy feedback [radio transmission]: "Command we got 350 at the middle, sir. 350."
00:10:27	Dc. Kavanagh: "Hey Tim, come here."
00:10:38- 00:10:41	Lt. Lamb: "10-4, one of you guys is going to have to shut your radio off. You're getting too much feedback.
00:10:43	Me: "Chief, I'm going to step out."
00:10:43	A PASS device begins to chirp, signifying that either Dc. Kavanagh or Ff. Ennis have not moved enough placate the demands of the motion sensor.

Ff. Ennis and I cannot communicate the status of the interior operations to the IC. The fire has already passed through the incipient stage into the growth stage (visual-embodied). Smoke is beginning to push out through the gap above the side-C door. Lt. Brodrick, Pff. Kehoe, and Pff. McGarrah kneel outside, donning their masks, flash-hoods,

and helmets. What I want to draw attention to is that there is still a wide array of genres being used, but as the evolutions begin new genres begin to emerge. Specifically, in this section there is a distinct increase of genres that draw from aural, oral, and tactile modalities. Additionally, radios and technologies such as SCBA, and PPE function as intermediaries through which messages are conveyed.

Training objective one: Primary search

00:10:45	I step out of the building.
00:10:47-00:11:02	Lt. Brodrick [radio transmission]: "Command from team one." A radio attempts to key up four times. Lt. Brodrick recognizes that I need help turning off my radio. He assists me. I reenter side-C, basement division.
00:11:05	Lt. Brodrick [radio transmission]: "Command be advised, team one is going to be entering [side-C]. We're going to be conducting a left-hand search."
00:11:17	Lt. Lamb [radio transmission]: "Command copies, team one entering the structure conducting a left hand search."

Team one, consisting of Lt. Brodrick and Pff. Kehoe enter the structure. A thick cloud of smoke escapes from behind the door as it opens. Lt. Brodrick allows Pff. Kehoe to enter first, then, ducks in behind him. A red LED flashes intermittently on back of Lt. Brodrick's flashlight (visual-analog). As they enter, I hear Lt. Brodrick, who carries a Halligan tool into the structure, sound the floor with its adz end (aural-kinesthetic-tactile). Following a left-hand search pattern down the side-C wall, Lt. Brodrick and Pff. Kehoe transition to the side-D wall (See Figure 3.7: Frame-grab of team one conducting a left-hand primary search (tactile-spatial). The two kneel and stay low to stay below the neutral-plane where the air is cooler (kinesthetic-tactile). Pff. Kehoe (furthest: center) uses his left hand to sweep the wall (kinesthetic-tactile).

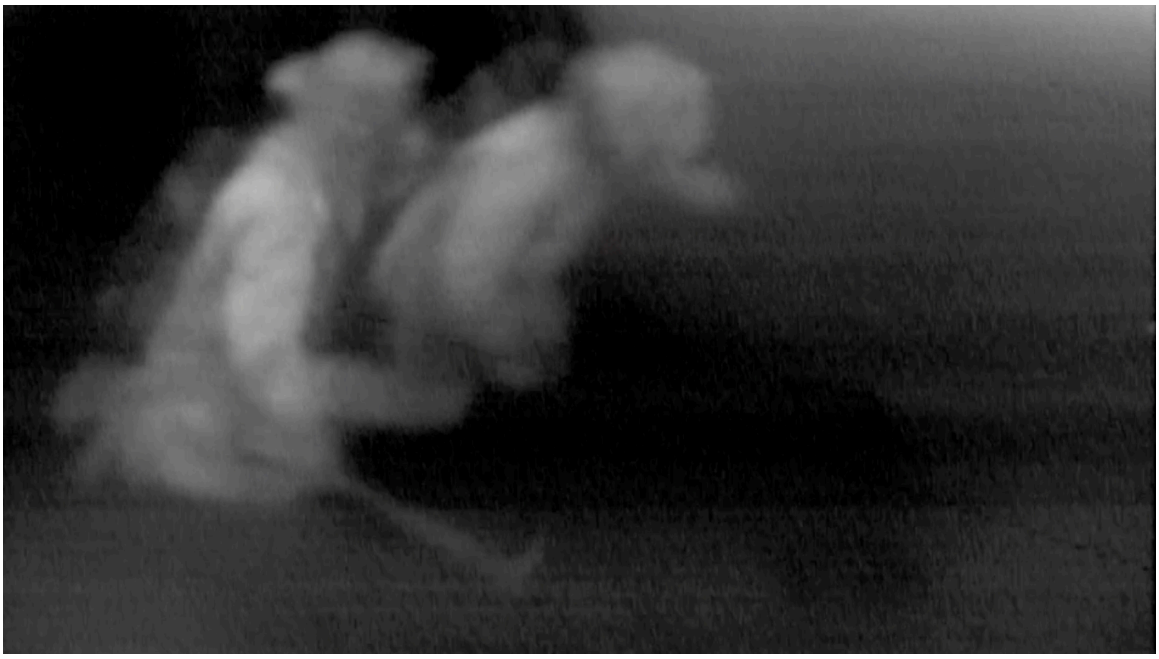

Figure 3.7: Frame-grab of thermal imaging footage of team one conducting a left-hand primary search (PD-TIC, 11:29; PD-A, 14:27).

Pff. Kehoe assumes a position closest to the wall. As a member of a primary search team, his responsibility is to maintain contact with the wall and communicate any

00:13:18	Lt. Brodrick to Pff. Kehoe [oral communication]: “We have fire in front of us.”
00:13:20	Lt. Brodrick keys up his mic [radio transmission]: “Command from team one.”
00:13:24	Lt. Lamb [radio transmission]: “Team one go ahead.”
00:13:26	Lt. Brodrick [radio transmission]: “Be advised fire is located in the C-D corner, ground floor—C-D corner.”
00:13:28	Lt. Brodrick [radio transmission]: “10-4 fire located in the charlie-delta corner.
00:13:30-00:13:35	The fire popping and crackling, oral discussion muffled by the SCBA facepieces Lt. Brodrick and Pff. Kehoe wear, and the Halligan repeatedly sweeping across the floor creates a rich, complicated soundscape within the structure.
00:13:46	Lt. Lamb [radio transmission]: “Team one from command.”
00:13:50	Lt. Brodrick [radio transmission]: “Go command.”

00:13:51 Lt. Lamb [radio transmission]: "You've been in five minutes, can I have a PAR check."

obstructions and/or points of egress (e.g., stairwells, doors, windows, furniture) he might discover to Lt. Brodrick. In Figure 3.7, the firefighters are positioned closely together. Lt. Brodrick grasps Pff. Kehoe's SCBA harness with his left hand, a way of maintaining contact which reassures the probationary firefighter that the lieutenant is present (tactile). The two can be heard speaking to each other (oral). Periodically, Lt. Brodrick reaches toward the center of the room, sweeping the floor with the Halligan tool which he holds in his right hand in order to search for obstructions and/or victims (kinesthetic-tactile). The coarse sound of steel scraping brick radiates outward with each sweep of the tool. Transitioning from the side-D to side-A wall, team one continues the primary search. Lt. Brodrick responds to IC's call for a Personnel Accountability Report (PAR) (oral-analog). The message is indecipherable.

From a rhetorical perspective, there is variance in what type of information might be included within the genre of a PAR, but at a minimum an officer or team leader will speak on behalf of all members of an operational unit to ensure the IC that the team members are accounted for. More elaborate PARs might also include the exact location of the team within the structure as well as the amount of air that the team has remaining in their SCBA cylinders. For example, "Ladder-1, crew of three, all accounted for, making progress on primary search *division 1*, *side-C,* 2500 psi." In this example, the operational designation of the team, "Ladder-1," is followed by a verbal account of the firefighters assigned to the team, "crew of three all accounted for." It also includes the operational status of the crew, "making progress on primary search", provides spatial coordinates for

where the crew is located, “division 1, side-C,” and describes the remaining air that the crew has, “2500 psi.” The proper procedure for reporting a team’s air level is to report only the air pressure of the lowest member. The rationale behind this is that the crew must enter and exit as a team, so if the lowest member has 2500 psi of air pressure in the cylinder all members work with an understanding that they have consumed nearly half the air in the 4500 psi cylinders that they wear. Pff. Kehoe locates a door and communicates this information to Lt. Brodrick (kinesthetic-tactile; oral). He asks Lt. Brodrick if they are going to leave the structure (oral). Lt. Brodrick answers, “Ok, we’re going out” (oral). The team of two completes their primary search, exiting where they had previously entered, the side-C door. As they exit, Lt. Brodrick informs the IC that his team is out, that team members are accounted for, and the task assigned (primary search of the basement division) has been completed(oral-analog).[20] As in the previous sections of this chapter, firefighters continue to make use of ICS as a heuristic for talking about space and coordinating work activities, oral genres are seen, and we see an increasing reliance on touch, tapping, and the use oral, face to face communications, to coordinate work at a team level, and aurality is used to garner sensory knowledge by the team as it performs this search. What I want to direct attention to is the diversity and situatedness of the genres being used in relationship to rank, and positionality on the fire scene. That is, whereas the team working within this IDLH environment relies upon embodied genres that make use of tactile, kinesthetic, oral, and aural modalities, those working outside predominantly rely on radio communications and sight.

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[20] Audiences who are closely following the spatial coordinates of this evolution will note that the firefighters are referring to side-A as side-C. A common practice at AFDTF is to allow training units to designate sides so that firefighters can practice applying this heuristic to structures. In this chapter, I have adopted the spatial coordinates that instructors uniformly assign to the training facility.

Training objective two: Fire suppression

The fire broadcasts, then rebroadcasts, a rapid succession of snaps and pops which signal that the fire is intensifying and nearing the free burn stage (aural). Although I can feel and hear the fire, which is less than 10 feet away from me, the smoke has grown so thick that I can no longer see any flame. I look down at the TIC that I am using to record images, and see that a well pronounced V-pattern ascends from the base of the fire which is located in the corner where the side-A and side-B walls converge (visual-digital). TICs offer firefighters visual renderings of the differing heat signatures of objects within the view of the lens. Whereas hotter objects are lighter in color, colder objects are darker in color. The TIC provides me with a way of seeing in an environment in which I would, otherwise, be unable to see. Unfortunately, the heat is climbing to a point where it is difficult for the TIC to render a visible distinction between objects: over half of the TIC's screen is reading *white out*.

Lt. Brodrick gathers Ff. Linn and Pff. Kehoe to perform a fire suppression evolution that will use two methods for extinguishing the fire. Lt. Brodrick keys his lapel mic to issue a radio communication: "Command from team one" (PDA, 00:16:44). Lt. Lamb responds back by radio communication: "Team one go ahead" (PDA, 00:16:45) (oral-analog). The radio message is indecipherable, but Lt. Brodrick informs the IC that he is entering to perform fire suppression. The team enters the structure carrying a pressurized water can which the firefighters will apply as a cooling agent to suppress the fire. As team one enters, Dc. Kavanagh helps to direct the team in but orders the crew to get low to avoid the heat that has filled the structure (oral). Kneeling, the crew fans out across the room (kinesthetic-spatial). Hissing steam can be heard as the team applies

water to the fire, knocking the bulk of the fire down (aural). “Figure 3.8: Montage of frame-grabs from thermal imaging footage of a team conducting fire-suppression activities” presents elapsed still footage of this crew performing fire suppression during this evolution. The montage of twelve frame-grabs derive from footage gathered using the (TIC) and a transmitter/receiver assembly. The white glow in the top of each frame is the first training fire positioned in quadrant-A abutting the corner where the side A and side-B walls meet. This series of frame-grabs has been assembled to demonstrate Ff. Linn (far right) actively suppressing the first training fire using a water can (read left to right, top to bottom). Specifically note, how as more water is applied to the fire (white glow) from more of the wooden palate becomes visible (dark lines) (visual-digital). Looking closely at the tenth, eleventh, and twelfth images of the sequence (bottom row) the unit (four fighters) can be seen gathered in a semi-circle facing the fire. This image provides a view of the heat differentials between the firefighters and instructors. Kneeling (from left to right) are Dc. Cavanagh. Lt. Brodrick, Pff. Kehoe, and Ff. Linn. By comparing the helmet and shoulders of the turnout coat that Dc. Cavanagh wears to helmets and those of the crew which has just entered, it is clear that Dc. Cavanagh’s gear has absorbed significantly more heat. Dc. Cavanagh has now been exposed to the heat for over ten minutes, whereas Lt. Brodrick, Pff. Kehoe, and Ff. Linn firefighters have just re/entered the structure.

Lt. Brodrick uses his right hand to tap Pff. Kehoe (as can be seen in the last image of the sequence), indicating that he would like the crew member to move closer toward the seat of the fire (tactile-kinesthetic-spatial). Ff. Linn moves toward this position. Repositioning they attack the fire from a different angle. Pff. Kehoe applies the stream

Figure 3.8: Montage of frame-grabs from thermal imaging footage of a team conducting fire-suppression activities (PD-TIC, 00:13:58-00:14:16; PD-A, 00:16:56- 00:17:15).
Here a group of firefighters perform fire-suppression using a water can. White indicates hotter objects; black indicates cooler objects.

from the water can to the base of the fire. “Hit the ceiling,” orders Lt. Brodrick (oral). Droplets from the stream bounce off the ceiling and rain down on the bulk of the fire which is effectively knocked down. Embers can be heard softly popping (aural). The firefighters will wait for the fire to rekindle, so that they can take turns practicing how to perform fire suppression techniques.

In the meantime, Lt. Brodrick calls the IC on the radio to inform him that he will be briefly exiting to grab the line, and then stands and momentarily leaves (oral-analog). Emerging from the side-C entrance, he picks up a handline positioned outside of the doorway. Ff. Larimore helps the lieutenant by feeding the line into into the structure (See Figure 3.9: Split screen view of Ff. Larimore helping push the line inside the structure to Lt. Brodrick from the doorway). Lt. Brodrick returns with a charged hand-line, and can be seen centered (standing) in the frame of TIC footage that is housed within a wider-frame exterior view of the activity.

As he approaches Pff. Kehoe, Lt. Brodrick kneels on the hoseline in order to maintain awareness of the location of the line within the environment (tactile-spatial). Taking the nozzle in his right hand, Lt. Brodrick grabs Pff. Kehoe guiding the trainee into a correct position to operate the nozzle (tactile-spatial) (Figure 3.10: Frame-grab of Lt. Brodrick positioning Pff. Kehoe on the hoseline). Ff. Ennis notices that Pff. Kehoe is alone on the line and that Lt. Brodrick is going to provide instruction, so he moves into a position to back up the probationary firefighter on the line. Lt. Brodrick provides instruction on how to correctly apply the nozzle stream to the fire (oral-gestural-kinesthetic). Lt. Brodrick uses a circular gesture to demonstrate how the hose stream should be applied to the fire (kinesthetic-gestural). Pff. Kehoe aims high at first, then,

Figure 3.9: View of AFDTF live-burn training structure from *side-C* (PD-A, 00:18:12).

Figure 3.10: Frame-grab of Lt. Brodrick positioning Pff. Kehoe on the hoseline (PD-TIC, 00:15:23; PD-A, 00:18:21)

rotates the nozzle clockwise to push the heat and smoke away from the crew. As the crew continues to apply water to the fire, the water turns to steam and pushes its way out of the side-C entrance of the structure (See Figure 3.11: A cloud of white-steam viewed from the side-C entrance). Firefighters are taught to read the colors of smoke, and a change in color from grey or black to white visually signifies that an engine company/suppression team/attack line has successfully applied water to the seat of a fire (visual-color).

Lt. Brodrick calls the IC to inform him that the fire is out and his crew is exiting. While he is making the radio transmission, he opens a window on side-B of the structure to ventilate by introducing cool air from the outside into the structure. Command copies the transmission: “received, fire’s out” (PD-A, 19:35) (oral-analog).

Figure 3.11: A cloud of white-steam viewed from the side-C entrance (PD-A,).

As the crews exit, Ff. Ennis transmits an important message to IC (oral-analog).

00:19:45-00:19:47	Ff. Ennis [radio transmission]: “Command from fire starter.”
00:19:49	Lt. Lamb [radio transmission]: “Fire starter, go ahead.”
00:19:51	FF. Ennis [radio transmission]: “The other fire just lit.”
00:20:01	Lt. Lamb [radio transmission]: “What was that?”
00:20:03	FF. Ennis [radio transmission]: “The fire in the other corner A/D just lit.”
00:20:04-00:20:06	Lt. Lamb [radio transmission]: “10-4, let me know when you want team 2 to come in.”

While the fire was actively suppressed, a condition of high heat still existed within the structure. By opening the window, Lt. Brodrick introduced oxygen to the structure which caused the second fire to auto-ignite. The second training evolution has inadvertently begun ahead of schedule.

Outside the firefighters are gathered in a circle facing one another, as they were before the first evolution started. Ff. Ennis exits the building, and has a brief face to face conversation with Lt. Brodrick. Ff. Larimore removes his helmet and takes a knee to don his SCBA mask (oral-visual). Pff. Kehoe and Pff. McGarrah have moved aways from the entrance where a great deal of activity rapidly unfolds. Ff. Linn walks with purpose to gather a halligan tool resting on the deck, and walks to the side-C entrance where Lt. Brodrick and Ff. Ennis are standing in the threshold. Inside Dc. Kavanagh and I are quickly shutting the windows in order to limit the amount of oxygen that the fire can pull from outside the structure which will slow its growth. Ff. Linn turns around and walks directly to a flathead axe which he picks up from the deck. He walks back to where Ff. Larimore is kneeling and places the axe down in front of him. The sound of the steel axe

head bouncing on the asphalt deck can be heard from inside (aural). Ff. Ennis and Lt. Brodrick turn and move away from the side-C entrance. Lt. Brodrick walks toward Pff. Kehoe and Pff. McGarrah. Ff. Ennis looks toward the direction of Lt. Lamb: he waves and removes his regulator (gestural-kinesthetic-visual). Ff. Larimore rises, walks, and picks up the New York hook that rests on the deck leaving the flathead axe where Ff. Linn had placed it for him. Lt. Brodrick and Ff. Ennis trade fleeting messages face to face (visual-oral). Ff. Ennis, then, turns to Ff. Linn who stands to his right. They then walk to the side-C entrance. Ff. Ennis gets to the door and does an abrupt about face, turning to where the flathead axe was placed by Ff. Linn. He picks up the tool and walks toward the side-C entrance. Ff. Linn and Ff. Larimore follow him. The three wait at the threshold. Lt. Brodrick has a discussion with Lt. Lamb. Pff. McGarrah and Pff. Kehoe adjacent to them. Pff. McGarrah is donning his helmet.

Training objective three: Team two conducts a primary search; Team one initiates a coordinated fire attack

A PASS device begins a slow rhythmic warning—*wee-whuuu, wee-whuu* (aural-kinesthetic). Covered in sweat, I consciously control my breath monitoring my pulse while kneeling in corner of the room where the side-B and side-C walls meet (embodied-spatial). I've been in the structure with Ff. Ennis and Dc. Kavanagh for nearly ten minutes, and I've consumed approximately 1200 psi of air from my cylinder (temporal; visual). I am doing my best to keep the TIC on the activity unfolding in the structure while also maintaining my own safety, keeping up communications with Dc. Kavanagh, and overseeing that the teams enter and perform work safely according to accepted practices (visual-embodied-aural-oral). I take stock of my own temperature, thinking

about the significant difference in thermal signatures between Dc. Kavanagh and the crew that had just entered and exited the structure with Lt, Brodrick (digital-visual-color; embodied; tactile). The TIC showed that Dc. Kavanagh's PPE had absorbed a good deal of heat, so I presume that my gear is also nearing the point where it might become saturated (analog-visual). In order to avoid over heating, Dc. Kavanagh and I hide from the radiant heat by repositioning behind the stairwell that subdivides the basement each time the crews exit (spatial-kinesthetic). This technique of using a wall to shield oneself from exposure to heat was a tactic that other instructors taught me when I was training to become a live-fire instructor at AFDTF. An added benefit of our current position is that we monitor crews while they enter and exit comparing the radio traffic to the aural and visual observations we construct inside (visual-aural-oral-analog oral-embodied).

00:21:15	Ff. Ennis [radio transmission]: "Team two to command"
00:21:18	Lt. Lamb [radio transmission]: "Command, fire starter go ahead."
00:21:21-00:21:23	Ff. Ennis [radio transmission]: "Team two to command we'll be entering with three for a search"
00:21:18	Lt. Lamb [radio transmission]: "10-4, team two entering with three for search"

Team two enters the building to perform a primary search, turning right through the side-C entrance. Ff. Ennis takes position on the side-C wall, followed by Ff. Larimore who files in just left of Ff. Ennis. Ff. Larimore establishes physical contact by holding onto the back of Ff. Ennis' air cylinder (tactile). Thereafter, Ff. Linn flanks in behind Ff. Larimore taking the position furthest from the wall. "Figure 3.12: A successive sequence of twelve frame grabs taken during the second fire of the night's training evolutions" depicts notable moments during the search. It is designed to be read left to right, top to bottom.

Figure 3.12: A successive sequence of twelve frame grabs taken during the second fire of the night's training evolutions. (PD-TIC, 00:18:43-00:21:24; PD-A, 00:21:41- 00:24:39
Here team two is seen performing a primary search during images one-nine. In images ten, eleven, and twelve team one enters, passing by team two and perform a fire attack.

The first image of the sequence shows the team using their hand-tools tools to sweep the floor ahead of them (kinesthetic-tactile). This technique allows the firefighters to reach further than their arms can allow and also to learn information about the structure. For instance, by sweeping the floor the firefighters might learn that a floor has collapsed or been compromised, discover obstructions such as furniture or walls which would impede forward progress, and/or the team may locate a victim. Notice how each firefighter uses a hand-tool in their left hand, while using the right hand to maintain physical contact with the firefighter/wall to their immediate right. The sound of steel grating across the uneven brick floor can be heard with each sweep of each tool. The firefighters use loud but muffled verbal communication to pass information to each other as they progress through the search. The sound of the fire popping and snapping can also be heard. It is a complex and rich soundscape (aural-oral).

Image two of the sequence depicts how the team spreads out to increase the search coverage of a room (spatial-kinesthetic). Ff. Ennis uses his right hand to sweep the side-B wall and search for secondary points of egress such as windows and doors that the team could use if the building became unsafe and the team needed to exit rapidly (kinesthetic-tactile). Ff. Larimore serves a bridge between Ff. Ennis and Ff. Linn who has a firm grip on the heel of Ff. Larimore's left boot. The team makes rapid progress, conducting a thorough search of quadrant A and quadrant B of the basement division. In image three of the sequence, the team reaches a steel burn-rack in the A/B corner and the team stops. At the AFDTF instructors commonly use the racks to simulate beds and cribs, hiding rescue mannequins in proximity. Ff. Ennis communicates a message to Ff. Larimore: "I have an crib, I'm going to check it; I'm gong to check it." Ff. Larimore can

be seen continuing to hold contact with Ff. Ennis' air cylinder while he turns to face Ff. Linn to pass the message on (oral-tactile). Essentially, the Ff. Larimore serves as an interface between Ff. Larimore and Ff. Ennis. By turning to face Ff. Linn and repeating Ff. Ennis' message, he insures that the left hand knows what the right hand is doing. Ff. Ennis communicates that "the mattress is clear." Ff. Larimore repeats, "clear," Ff. Linn repeats back to Ff. Larimore "clear." Ff. Ennis, "alight." Now on the side-A wall the team makes progress toward the side-D wall.

What I want to draw attention to is the robust array of multimodal genres that members of this team are orienting simultaneously while performing this search. "Figure 3.13: Team two's genre ecology" is a visual representation of the ways that those genres intersect during this search. Specifically, this visualization demonstrates that members of the team are using predominately using oral, tactile, kinesthetic, and aural modalities to make and communicate knowledge within the team. It also shows how Ff. Ennis serves as a passage-point for all radio communications between the team working inside, and the IC who is managing/coordinating the activities for the evolutions from the exterior. In chapter five, I a take up a more robust discussion and analysis of of these ecologies, but this visualization aims to help clarify the interrelationships that I have been describing within this aspect of the search.

Outside of the structure, Lt. Brodrick lays belly down on deck looking into the building through the side-C entrance. The neutral plane has pushed so low—to a point slightly above a foot off the ground. By positioning himself in this way, Lt. Brodick observes the crew as they move through the space. As an officer, it's likely that he's watching to see how thorough a job they are doing so that he can latter offer praise and/or

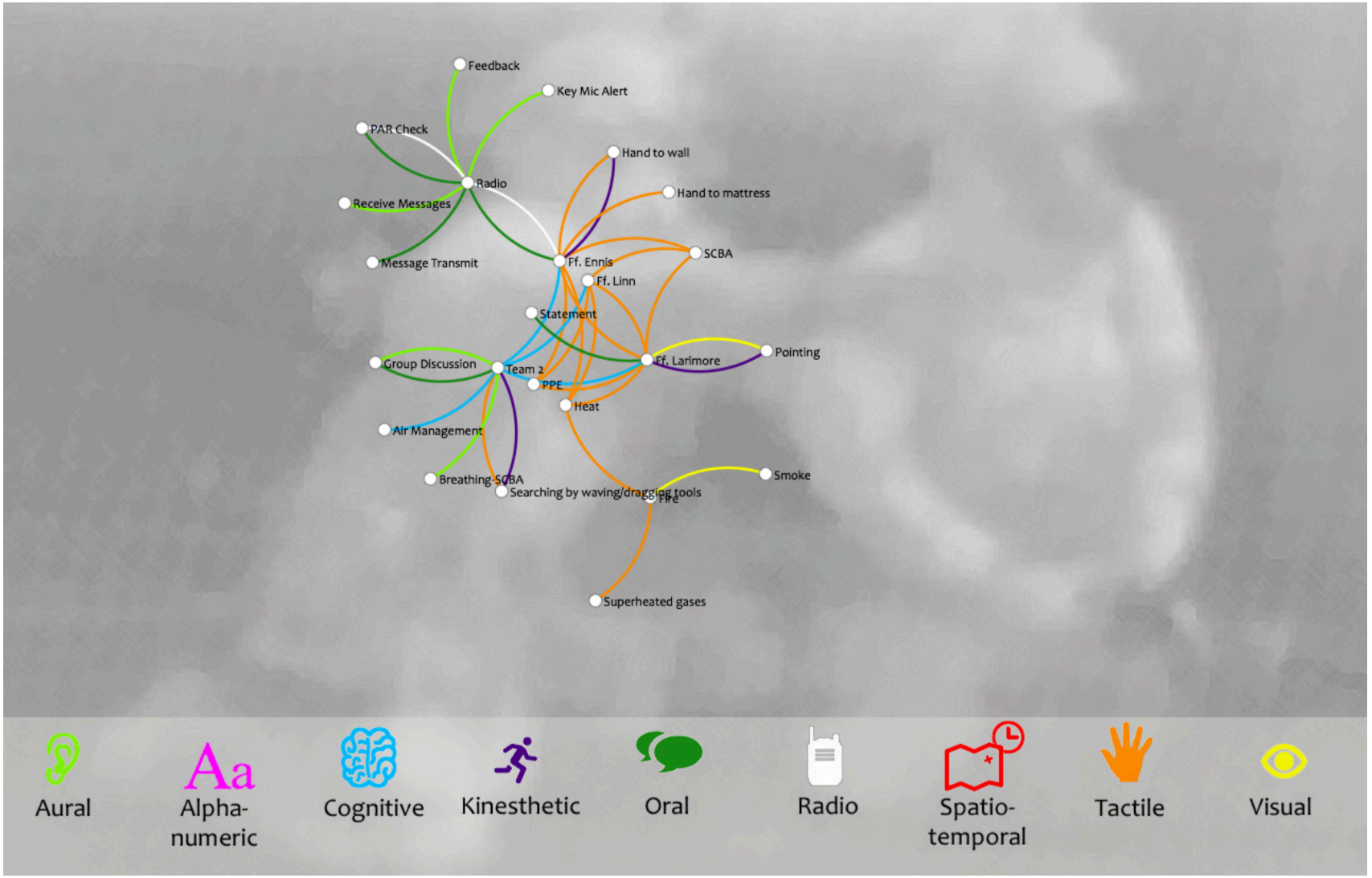

Figure 3.13: A visualization of team two's genre ecology

insight about how well the crew conducted the search (visual-spatial). Above Lt. Brodrick, a thick grey cloud of smoke billows out of the side-C entrance. From outside of the structure, it is clear that interior conditions are deteriorating as smoke is being forcefully ejected through the gaps of windows on side-C and side-B. This is an indicator that pressure from within the compartment is increasing as the fire consumes oxygen and attempts to pull oxygen inward from outside, while simultaneously pushing products of combustion outward. Lt. Lamb keys his lapel mic to speak (visual-color-movement).

00:22:10-00:22:12	Lt. Lamb [radio transmission]: "Team two from command."
00:22:11	[The team comes to an abrupt stop.] (see the fourth image of the sequence).
00:22:16-00:22:17	Ff. Ennis: [radio transmission; heavy feedback]: "Team two answering command"
00:22:17-00:22:19	Lt. Lamb [radio transmission]: "Be advised you have heavy smoke pushing out of the Bravo and Charlie side."

In image five of the sequence, Ff. Larimore can be seen dipping his head to listen to the message that Lt. Lamb conveys to the team via the portable radio that Ff. Ennis carries. This image also shows that Ff. Ennis' helmet is markedly whiter than those of Ff. Larimore and Ff. Linn, as he had spent a good deal of time inside serving as the FO within the structure prior to his re-entry with team two. While Lt. Lamb completes the message, Ff. Larimore points ahead toward the side-D wall. Outside Lt. Brodrick stands up and backs away from his position on the deck; he shuts the door to limit the flow of oxygen that the fire can pull into the structure.

00:22:26	Ff. Larimore says something softly to Ff. Ennis.
00:22:27	Ff. Ennis: "What's that?"

00:22:28 Ff. Larimore [oral message, raises volume of voice]: “Let him know we got fire.”

00:22:30-00:22:33 Ff. Ennis [radio transmission; heavy feedback]: “Command we have fire rolling in the B/C corner.

00:22:39 Ff. Ennis [oral message]: “Ok, guys.”

00:22:40 Ff. Larimore [oral message]: “Let’s go; let’s go.”

The crew resumes the search. They must pass by a point which narrows because that is where the stairway to division 1 begins. Each firefighter assumes a position slightly to the left of the firefighter in front and holds on to the boot of the firefighter directly in front of him. Ff. Ennis leads, followed by Ff. Larimore, then Ff. Linn (see image seven of sequence). The team quickly passes by the pinch point and continues the search along the side-A wall, then, transitions to the side-D wall. Ff. Linn swings his tool for a sweep. It connects with Dc. Kavanagh’s boot; he continues on, not mentioning the information to his team members (see image eight of sequence). Outside team one, consisting of Lt. Brodrick, Pff. Kehoe, and Pff. McGarrah prepare to make entry with the hose-line. As team two nears the corner where the side-C and side-D walls meet, IC calls for the attention of team two. The team abruptly stops (see image nine of sequence).

00:23:10 Lt. Lamb [radio communication]: “Command to team two, team two.”

00:23:12 Ff. Ennis [radio communication]: “Command, go ahead.”

00:23:18 LT. Lamb [radio communication]: Informs team two that team one is at the door preparing to make entry, and ask for the team to provide a PAR check.

00:23:20 Ff. Ennis [oral communication]: “What do you got for PAR check?”

00:23:24 Ff. Larimore: [Looks at air pressure display gauge makes oral communication]: “35.” [Looks to Ff. Linn makes oral communication]: “What do you got?”

00:23:28 Lt. Brodrick [radio communication]: “Command from team one.”

00:23:32	Lt. Lamb [radio communication]: “Team one, go ahead.”
00:23:33-00:23:39	Lt. Brodrick [radio communication]: “Team one will be entering with three, fire suppression.”
00:23:33	Lt. Brodrick [radio communication]: “Command from team one.”
00:23:40	Ff. Linn [oral message]: “I don’t know.” [Ff. Larimore reaches for Ff. Linn’s gauge and takes a reading].
00:23:41	Lt. Lamb [radio communication]: “10-4, team one entering with three.”
00:23:45	Ff. Ennis [radio communication]: “Command from team two.”
00:23:48	Lt. Lamb [radio communication]: “Command two, go ahead”
00:23:50	Ff. Ennis [radio communication]: Transmits unreadable message

The diaphragm in my regulator assembly is making a vibratory hum with each breath I exhale. The vibration makes my nose tickle and itch; I grimace, again and again, hoping to appease the sensation. Team one enters the structure and begins to advance the hose-line. As they near team two, Lt. Brodrick tells his crew to hold up (oral). Team two quickly advances around the crew members from team one advancing along the side-C wall toward the entrance (see images ten and eleven of sequence). Team two reaches the doorway. Ff Ennis keys his mic: “team two, command.” Lt. Lamb answers, “Go ahead.” Ff. Ennis: “we’ll be exiting side alpha with three; primary search complete” (oral-analog). Lt. Brodrick calls seconds later: “Command from team one”. Lt. Lamb answers, “Team one.” Lt. Brodrick responds: “We’ve located the fire” (oral analog). Pff. Kehoe has the nozzle, Pff. McGarrah is backing Pff. Kehoe up, and Lt. Brodrick is positioned on the opposite side of the line. As they near the fire, Pff. Kehoe turns back to Lt. Brodrick. They engage in a number of oral exchanges of information. Lt. Brodrick points to the location of the fire and the hose line (gestural-visual). Pff. Kehoe begins to apply the fire stream.

Figure 3.14: Crew one performs hydraulic ventilation (PD-A, 27:02).

As the water flows across the floor, the black thermal reading turns grey, the water has absorbed heat from the fire. The suppression crew, team one continues to apply water. Lt. Brodrick helps Pff. Kehoe with the application of the stream, changing the variable nozzle pattern from a straight stream to a fog stream. This change in tactics enables the fire to convert the fog droplets to steam more rapidly. While this method disrupts the thermal layer considerably (forcing high heat to the floor) it also suppresses the fire more rapidly because the expansion of steam displaces the oxygen in the structure and chokes the fire out. Once the fire is suppressed, Lt. Brodrick orders the team to move to a window on side-C (oral). He transmits a message to command to inform him that the crew will be performing hydraulic ventilation of the structure (oral-analog). The crew opens a window on side-C and directs a mid-size fog stream out the window.

The nozzle pushes air flow out of the window ejecting heat and smoke which cools the building and improves visibility within the structure (see Figure 3.14: Crew one performs hydraulic ventilation). As the team completes ventilation of the structure, Lt. Brodrick calls command to inform him that the team one will be exiting the building. Dc. Kavanagh directs me to do a sweep of the building. We realize that Ff. Ennis is no longer with us. He failed to communicate that he was going to leave our team to join team two.

We perform a sweep of the building which is negative. I inform the Deputy Chief that it is certain that he has already exited: we have performed multiple thorough sweeps of the floor using the thermal imaging camera (analog-kinesthetic-tactile-visual- digital).

Training objective four: *Perform a secondary search of the structure*

Outside of the structure, Lt. Brodrick, Pff. Kehoe, and Pff. McGarrah remove their masks and begin a discussion. Meanwhile, team two dons their face-pieces. The crew prepares to conduct a secondary sweep of the building. Inside, Dc. Kavanagh and I begin to make our way up the center stairwell to begin our own sweep of division one. Lt. Lamb transmits an radio order (oral-analog). Team two will be moving to the second floor in order to perform a secondary sweep of the building, working their way down. Lt. Brodrick begins to open windows on the basement division from the outside. Ff. Ennis calls command, "team two will be entering with three, side-Bravo" (oral-analog). As Dc. Kavanagh and I make the stairs to division two, a member of team two strikes the floor in order to ensure its structural integrity (kinesthetic-tactile). From a distance, I hear the muffled voices of a team of firefighters speaking through their face-pieces (aural). The echo of voices and tools chimes, as they make reverberate off the concrete walls. It makes locating the team difficult. I turn a corner at the top of the stairs, using the TIC to visually locate the team in quadrant-A of division two.

As the team two enters the room from a hallway, the team spreads out as they had during the previous searches. Follow the architectural layout of a Cape Cod the rooms on the second division are smaller spaces. It is less efficient for a crew of three or more to complete a search in these smaller rooms. So, instead of searching smaller rooms as a full-unit, it is customary to leave a firefighter at the doorway adjacent to the hallway

Figure 3.15: Team two maintains physical contact during a search (PD-A, 30:39).

(control-person). The technique is beneficial because it allows the door or control person to ensure that the egress point is not becoming compromised by fire extension, while the other members of the team clear rooms (kinesthetic-spatial).

Figure 3.15: Team two maintains physical contact during a search depicts team two entering the bedroom that takes up the one half of division two (quadrant-A and quadrant-B). In this image, Ff. Ennis (left) holds an axe and maintains the hallway just in front of the door through which the crew entered the room. Ff. Larimore takes the middle position. He looks toward Ff. Ennis; his leg outstretched to maintain contact with Ff (tactile). Ennis. Ff. Larimore holds the right heel of Ff. Linn's boot, while Ff. Linn sweeps the wall. Ff. Linn locates a window, and conveys this information to the other team members: "I've found a window" (oral). By sharing information, Ff. Linn keeps the rest of the crew aware that multiple points of egress exist. If the crew encounters a situation where they needed to escape by an alternate route, they can call command to ask for a ladder to be deployed to the side-B second floor window. Or, if the need to exit was

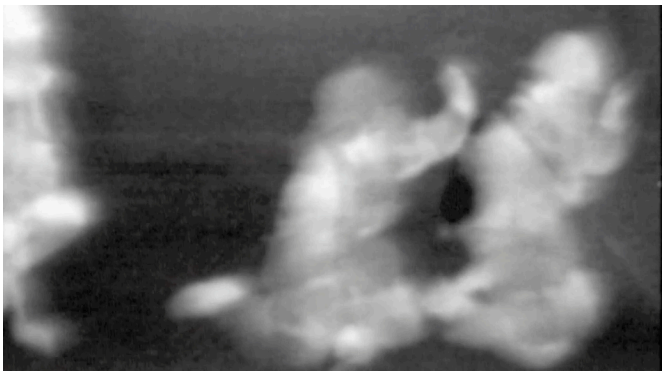

Figure 3.16: Ff. Larimore signals for Ff. Linn to begin the search (PD-A, 30:41).

immediate, the firefighters could take their chances jumping from the second division of the structure.

Ff. Larimore is ready to separate from Ff. Ennis, so he gives Ff. Linn a hearty pat on the shoulder which indicates that they can begin forward progress in the search (kinesthetic-tactile) (see Figure 3.16: Ff. Larimore signals for Ff. Linn to begin the search). Ff. Ennis taps the floor rapidly with the axe to serve as an aural reference point for Ff. Larimore and Ff. Linn who fan out and search ahead of the control-person in the smaller sized room (See Figure 3.17: Ff. Ennis uses his axe to provide an aural reference point). By using tools in this way and distributing the crew across the space, the crew is able to move rapidly through the quickly complete the search. As with the earlier searches, the wall-person, Ff. Linn, continues to maintain contact with the outside wall with his hand. Meanwhile, Ff. Larimore keeps contact with Ff. Linn by holding his boot. Ff. Ennis continues to bang away at the floor, providing the team members a secondary point to orient to as the team navigates. If the crew

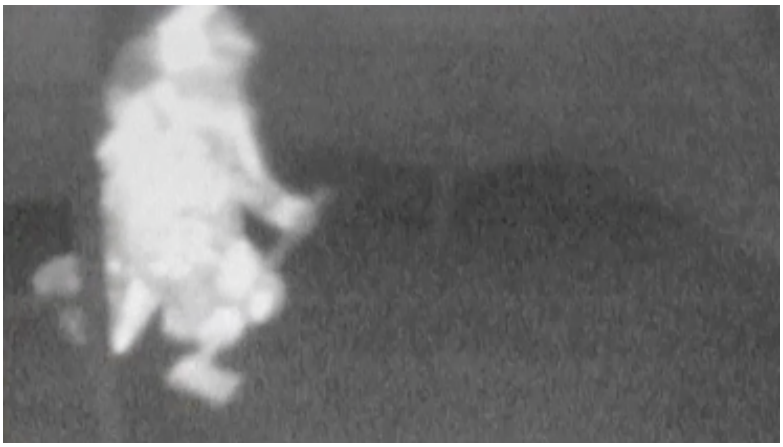

Figure 3.17: Ff. Ennis uses his axe to provide an aural reference point (PD-A, 30:51).

needs to exit quickly, they can simply turn and follow the outside wall back to the tapping of Ff. Ennis' axe. Or, if the two members discover another room, they can can yell back to Ff. Ennis, directing him to chase the left hand wall until he meets up with them.

"Clear." "Clear." "I'm over here." "Clear." The crew decides to continue forward. Ff. Linn yells back to Ff. Ennis: "Get up here." Ff. Ennis chases the wall, closing up the gap. Ff. Linn passes through the threshold continuing the left hand search down the side-C wall. He locates a window and opens it. Ff. Larimore and Ff. Ennis slide into the room behind him. When Ff. Linn sees that Ff. Larimore and Ff. Ennis are safely in the small room, he points to the two to move ahead to the next room that is directly in front of him (see Figure 3.18: Ff. Linn signals for Ff. Larimore to move into the lead position). Members of seasoned crews often piggyback off of and around one another like this, organically trading the positions and roles in order to move efficiently through confined spaces such as hallways.

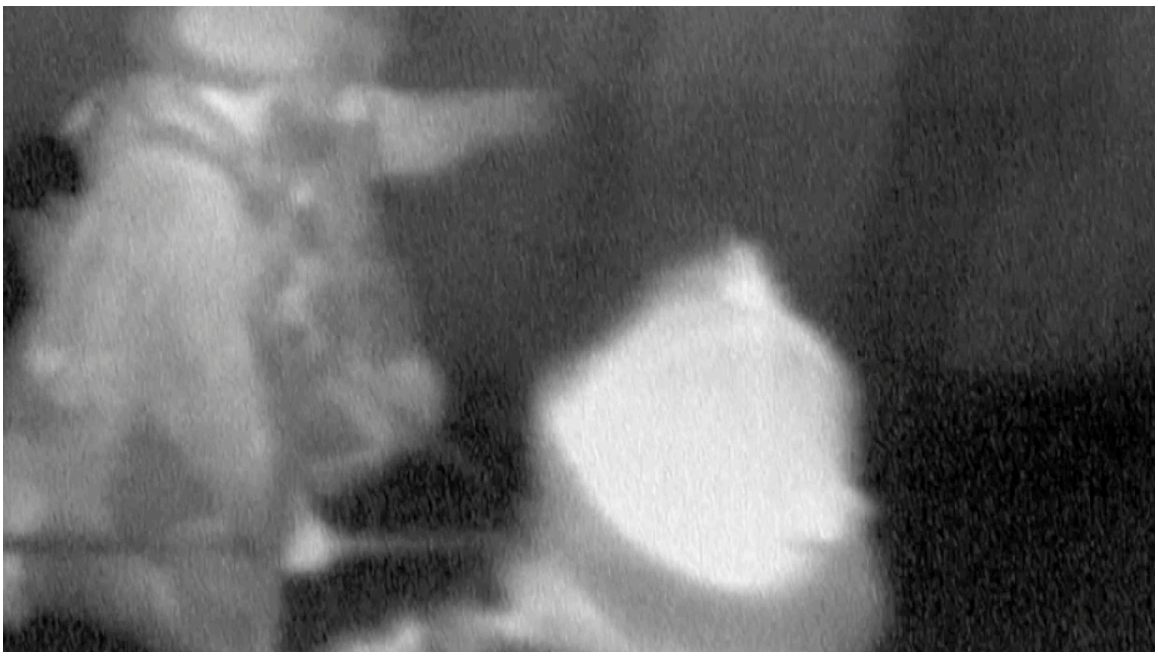

Figure 3.18: Ff. Linn signals for Ff. Larimore to move into lead position. (PD-A, 00:31:23).

In this case, Ff. Linn was the first to enter this extremely small room, and now Ff. Linn is now blocked in by Ff. Ennis and Ff. Larimore. Rather than fight through them to be the first to pass through the the next door, his gestural indication informs Ff. Larimore that he now has lead. Ff. Larimore processes the gesture immediately, and passes by Ff. Linn. Ff. Linn looks toward Ff. Ennis, who tells Ff. Linn, "I got door." He begins to sound his axe on the floor as before, maintaining control of the hallway as an egress point. Lt. Lamb calls team two on the radio: the team stops abruptly.

00:31:40 Lt. Lamb [radio communication]: "Team two from command."

00:31:42 Ff. Ennis [radio communication, heavy feedback]: "Team two, go ahead."

00:31:46 Lt. Lamb [radio communication]: "Can I get a condition report?"

00:31:49 Ff. Ennis [radio communication]: "Light smoke condition, no fire showing."

00:31:53 Lt. Lamb [radio communication]: "What's your location?"

Before the PAR check, the team had just completed a sweep of division two. Tactically, the team is in a moment of transition, so it takes the members a moment to discuss their next move before calling a location. The team makes a decision to travel down the center stairwell. The decision to wait to respond to the PAR allows the crew to quickly transitions to division one before calling command instead of responding with PAR. As Ff. Ennis communicates the message, Ff. Larimore and Ff. Linn sounding each stair with their respective hand tools (oral-analog; kinesthetic-tactile).

By probing the stair before placing weight on the stair, the firefighters determine the structural integrity of steps in order to avoid falling through the stairwell (kinesthetic-

tactile).[21] Ff. Ennis tells command, "We're going down the stairs to the first floor, down the stairs to the first floor" (oral-analog). Lt. Lamb copies, "Received making the stairwell to the first floor; give me a condition report when you get there please" (oral-analog). An pneumatic alarm of an ETOSI alarm begins to sound (aural-tactile). The crew continues to open windows. I ask Dc. Cavanagh if the low air alarm is him (oral). He responds in the affirmative (oral). Ff. Ennis hears the ETOSI and calls command to inform him that there is a low air alarm in the building (aural; oral-analog). Low air alarm is an urgent fire-ground issue which firefighters are trained to treat as an emergency as such in all circumstances, even on the training ground. On a number of occasions, I've been instructing at the building when firefighters reached low air and maydays were called, activating the RIT team to help evacuate the firefighter with a diminished air supply exit the building expeditiously. A mayday is the most serious message that can be broadcast on a fire-ground—trumping all other fireground communications which must immediately cease (oral-analog). In this case, it's a non-mayday low-air situation. IC/Lt. Lamp responds by telling Ff. Ennis to make sure safety/Dc. Kavanaugh, exits the building. The role of SO is passed to me. Ff. Ennis directs Dc. Cavanagh out the side-D door of division one, while Ff. Linn, Ff. Larimore, and I open up the building. Lt. Lamb calls for us to stand down (oral-analog). The evolution is now completed. We complete a final safety sweep of division one to ensure that the floor is clear (kinesthetic-visual-tactile). It is. We meet up and exit through the side-D door of division one and meet up with Dc. Cavanagh who is waiting with us. We call command to ensure he is aware that all members are accounted for. Lt. Lamb informs Dc. Cavanah that the cumulative time

[21] Of course, they are simulating this behavior because the firefighters are well aware that the building is concrete training facility that is inspected for structural integrity regularly.

of evolutions was twenty five minutes. We all organize in a circle outside of the side-C entrance of the basement division where the drill began. We conduct a debriefing analyzing the effectiveness of the skills practiced during the training, including areas to target attention in future drills. We clean and secure the training building as a team.

After action analysis

In relation to the six other field visits where I gathered observational data, this training was the least complex in a number of ways. Foremost the training evolution described above included the fewest number of participants/firefighters. The training session which involved only two evolutions—which, technically, ended up being one because of the inadvertent auto-ignition—as opposed to the others which included four or more evolutions. Moreover, this training session also was completed in the shortest duration of time. What is significant is that despite the simplicity of this training session, there was a significant degree of communicational complexity.

It was also clear that firefighters make use of wide array of multimodal genres in order to construct and communicate knowledge. Examples of these multimodal genres might range from NPFA standards to SOGs, from practices for navigating and speaking about space to practices for reading smoke or understanding how fire will spread according to building architecture, and from clothing and equipment that firefighters wear that communicates on their behalf to embodied senses that firefighters use to make sense of the safety of a structure such as feeling for heat with earlobes or sounding floors. Whereas some of these genres are used as expressly communicative genres such as a PAR or a size up, others such as when the firefighters draw from their embodied

knowledge of heat are predominantly used in a mediational capacity to support or reinforce knowledge they are simultaneously gathering from other sources.

Indeed, this chapter has only scratched the surface of the richly layered literacy tapestries that under-grid the practice and activity of firefighting, especially because the observations and readings of practice offered here are my own. Building on the view of practice extended here, the following chapter draws from interviews with participants and attempts to synthesize trends in how participants' descriptions of the types of communications practices, tools, and challenges matter most with/for firefighting. It is a chapter in which firefighters situate literacies in relation to the larger activities that they support, highlighting the competing and conflicting ways that firefighters strategically resist and leverage distinct literacies in fireground settings. Thereafter, in Chapter Five, I juxtapose the portions of the observational data offered in this chapter with portions the interview data offered in Chapter Four in order to complicate the view of activity each offered.

CHAPTER FOUR

Unsettling traditions: Comforting practices, ad hoc genres, and affective longevity

> When research reports ignore the power of institutional styles, genres, and disciplines to enforce the dominant cultural positions at the expense of dissenting positions, they misrepresent the cultural complexity of much writing in professional and institutional settings.
> (Herndl, 1996, p. 455)

> In situations of risk, knowledge is uncertain. Situations of risk produce multiple narratives —visible in the differences between union, management, and mining agencies' narratives of the 'cause' of an accident. This notion of risk goes beyond a simple relativism (each person has his own viewpoint or interpretation) in order to argue that risk knowledge requires knowers to understand each viewpoint provides a situated but incomplete view of the whole. In these environments having access to more than one viewpoint—the viewpoint of an engineer and the embodied experience of the miner—may provide decision makers with a greater range of problem solving strategies than any single representation from a single view point.
> (Sauer, 1999, p. 327)

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September 9, 2013: A refulgent dance of cherry brushstrokes and chrome glints intermingle on Rescue 6, as I pass beneath the open apparatus doors of Alliance Fire District's Station 4, Kromley Fire Department (KFD). A panoply of uninhabited sets of turnout gear hang from steel racks which run the midline of the apparatus floor. Aside from patches and lettering that denote otherwise, the black turnout gear mirrors the style which is worn by members of the New York City Fire Department (FDNY). The resemblance of the empty shells serves as a striking reminder that in two days members of the fire service will honor the three hundred and forty-three FDNY firefighters who answered their final alarm—box 8087—while effecting the largest rescue mission in the history of the fire service. Hidden behind the small sliver of privacy the rack offers, a lone firefighter assigned to watch sits eating a sandwich. He wears a navy blue station shirt, which, in keeping with the fireservice's generic parameters, houses a white maltese cross on the left breast.

***

Approaching, I ask, "Good afternoon, is Lt. Lewis in?" He raises his eyes, slowly, from his sandwich, fixing them on a set of the double doors. He nods his head toward the door, once. There is neither a need to welcome me nor introduce himself. Perhaps, he views such behavior as an unnecessary social courtesy that becomes an impediment to efficiency when seconds count. Like the rest of us, he is uniformly nondescript, fulfilling a function as forthwith as possible. It doesn't matter who he is, but rather that he does. I step through the double-doors and proceed down a hallway passing a series of bunk-rooms (each six by eight feet) where the resident firefighters live and sleep. Pictures adorn the walls. Images of firefighters—mostly, men, white and young—from now and before who proudly earned the right to wear a 4 on the crest of their helmet shields. Images of fire—in homes, businesses, vehicles. Images of work—glimpses of the moments that firefighters live for and civilians dread. Images of heroism, courage, and brotherhood. Images that say this work matters—offering respite to those who have grown weary under the weight of shouldering the uniform. Images that compel men and women to put on a uniform inscribed with symbolic reminders of the material consequences that are associated with the profession.

Met by a thunderous wave of pipes and drums—opening the door to the day room—I feel the hair on my skin rise. Lt. Chris Sweeney, Ff. John Nelson, and Ff. Tom Hunter, and Lt. Mark Lewis are intensely focused on the hundreds of firefighters, who surrounded by towering skyscrapers, march down the center of a Chicago street wearing class-A uniforms. I glance at the screen, and, then, glance at Lt. Lewis, who rests in a recliner with his leg boosted up, eyes unwaveringly committed to the screen. It is a fictitious scene from *Backdraft* (1991), but Lt. Lewis reveres duty and sacrifice so it

would be uncharacteristic for him to break his attention during a moment like this. From our conversations, I have pieced together that prior to coming to KFD, Lt. Lewis served a number of combat tours oversees with the U.S. Marine Corps. Generally, he avoids discussing his service, but when Lt. Lewis speaks of it he offers so few specific details that it is likely that he is/was a member of U.S. Special Operations Forces. At twenty-six, his eyes display a wisdom—a fearless ability to look on, and through, tragedy—that comes only through lived experience. It is a trait that befits a firefighter. Within the KFD rank-structure, he serves as a lieutenant on Rescue 6 which is one of two special technical rescue units that operate in the AFD. Currently, he is "non-operational" due to a knee injury he sustained when an intoxicated patient collapsed on him during a medical run. It is clear that he is not thrilled about his current status, as he is not the type that takes well to sitting around.

On the wall above Lt. Lewis an American flag hangs which lists the name of each of the three hundred and forty-three: from Ladder 118's Joseph Agnello to Engine 285's Raymond York. On the wall to my back, a memorial with the latin phrase *Nostrum Frater* honors an Assistant Chief who passed away in the line of duty death during an accident at the station. The material artifacts that line the walls at KFD reinforce the harsher realities associated with working as a firefighter. They are reminders that in the fireservice, we go about our duty—namelessly—until we do not. From a rhetorical perspective, such artifacts work as epideictic genres which commemorate and historicize cherished moments of KFD's past, enabling members of the organization to situate themselves within the larger cultural traditions associated with the department and the U.S. fireservice. Still, while these epideictic genres perform important social, psychological,

and ideological functions within the fireservice, they are also subject to widespread media appropriation and distortion. Popular movies like *Backdraft* and *Ladder 49*, television programs such as *Rescue Me* and *Chicago Fire*, and even the local and national news dramatize firefighting, offering partial, overly simplistic accounts that not only neglect and discount important aspects of the work that firefighters perform, but also—even more problematically—romanticize catastrophe, suffering, and loss.

With the aim of interrupting dominant narratives about what it means to work as a firefighter, this chapter draws attention to the mundane ways that firefighters "use writing to do work in the world on their terms and in their own interests" (Grabill, p. 211). Undoubtedly, firefighters' literacy practices might appear less sexy than the types of heroic stories of brave firefighters risking life and limb to rescue people trapped within burning buildings which circulate more commonly in mainstream media about what it means to work as firefighter. However, "we should recognize," as Stuart Blythe (2007) asserted, "that most institutional maintenance practices involve reading and writing" (p. 177). Focusing on the literacy practices of firefighters, then, not only foregrounds the knowledge work that firefighters perform as rhetorical agents and technical communicators, but also facilitates a deeper appreciation of ways that these mundane practices make moments of heroism possible in the first place. As Chief Stephen Russo put it, "you know, as a firefighter, not every single day you're running down the road with your hair on fire.... Sometimes it's very mundane."

This chapter draws from data collected during open-ended interviews conducted with 12 firefighters between August of 2012 and August of 2013. Participants who volunteered from the larger pool of participants were asked to discuss the ways that

literacies featured within their workplace activities. While the interviews were open-ended, participants were asked to address the following three general prompts and elaborate on ideas that they were interested in speaking about: (1) How you think literacies and/or communication matter for the work you perform? (2) What practices do you use to communicate and/or make knowledge at a scene or event? (3) What aspects of literacy and/or communication do you believe matter most to firefighting? Welcoming me into their stations with open minds and hearts, these firefighters fielded questions, shared stories, recalled events, and reflected upon the types of practices they utilize to construct and communicate knowledge on firegrounds and other emergency scenes. One of the most interesting aspects of the interview process was the choice participants made when offered the option to interview individually or as part of a group. While firefighters who held positions of upper-command within departments (e.g., chief, deputy chief, assistant chief, battalion chief) opted to interview alone, firefighters who identified as members of companies and held the rank of captain, lieutenant, or private requested group interviews. Aside from probationary firefighters, members of all standard ranks within the fireservice were represented. Furthermore, participants hailed from a mix of career and volunteer departments of differing sizes, ranging from approximately 20-150 uniformed personnel. Aside from their responses on informed consent forms, participants were not asked to provide demographic information regarding gender, race, ethnicity, and/or age (See Table 4.1: Interview participants).

In contrast to the observational data, which provided a glimpse of the multimodal literacy practices that firefighters used openly at a surface level, the interviews offered participants the opportunity to describe aspects of their practices that were either

Rank	Name	Department	Personnel in Department	Type of Department	Predominant Unit Served	Years in Current Rank	Years in Department	Years in Fire Service
Chief	Ron Burke	Coalition Fire Department	>150	Volunteer	Command	10	47	47
Chief	Stephen Russo	Baytown Fire Department	32	Career	Command	9	9	43
Deputy Chief	Paul Kelly	Coalition Fire Department	>150	Volunteer	Command	8	38	38
Captain	Robert Lynch	Millwick Fire Department	117	Career	Command	5	28	36
Captain	Keith Gray	Massachaug Fire Department	26	Volunteer	Command	2	8	8
Lieutenant	Joe Maynard	Massachaug Fire Department	26	Volunteer	Rescue	2	7	7
Lieutenant	Terry Healey	Massachaug Fire Department	26	Volunteer	Engine	2	5	5
Lieutenant	Sam O'Rourke	Massachaug Fire Department	26	Volunteer	Ladder	2	5	5
Private	Stanley Smith	Massachaug Fire Department	26	Volunteer	Ladder	5	5	5
Private	James Crawford	Massachaug Fire Department	26	Volunteer	Ladder	5	5	5
Private	William Jordan	Massachaug Fire Department	26	Volunteer	Rescue	5	5	5
Private	Vincent Prior	Millwick Fire Department	117	Career	Engine	5	5	9

Table 4.1: Interview participants

inconspicuous or otherwise imperceptible. It was during these interviews that I discovered a deep admiration for these firefighters, because they not only fearlessly revealed how their own and others' multimodal literacy practices intersected with sites of organizational conflict and contention, but also courageously retraced the ways that they had utilized multimodal literacy practices during events that had clearly been emotionally jarring. Although physical labor such as advancing hand-lines, climbing ladders, operating chain-saws, and wielding axes remains consequential to the activity of firefighting, curiously, it appeared infrequently in participants' description of work. Whether speaking with firefighters who worked the line or those who manned the command post, I discovered that the participants not only had little to say about the physical side of their work, but also that the participants were deeply interested in articulating the ways that cognition and communication facilitated or impeded their work. Indubitably, participants avoided modular descriptions of work which apportioned thought and decision making solely to command staff, but instead foregrounded the diversity of genres, tools, and modalities that they might utilize to communicate and (co)construct knowledge in order to realize aims such as coordinating work, identifying risks, promoting safety, navigating space, and/or constructing identity and credibility within the organization.

Due to my own positionality as both a firefighter and rhetorician, I hypothesized that all firefighters contribute to the production of knowledge on a fireground, so I was delighted when participants recognized the value of the different types of semiotic work that they and other firefighters regularly perform. To some extent, the regularity with which participants used the term *communications* to describe "reading and writing"

practices they used on the fireground indicated that participants were clearly familiar with the aims of the study, but I considered the use of the term as a catch all to describe *multimodality, rhetoric,* and *literacy* as a sign that they were nevertheless speaking authentically about the ways these issues mattered for their work. For example, while reflecting on Private Vincent "Vinny" Prior's transition from probationary status to a trusted interior firefighter, Captain Lynch paused, briefly searching for the right word to describe how literacies related to Vinny's growth as a firefighter:

> I don't have to worry about [telling Vinny what to do] anymore. And, that's what you see...what you've seen...the transition from the day I showed this rookie what he has to do to five years later, it's just done because we communicated, and continue to. I keep going back to the word communications, I don't know what other word you want me to use, but I know that this is part of service.

I wanted to privilege his description of work, and not my own terms, so I replied, "yeah, whatever word you think is appropriate is the word I'm looking for. The whole reason for the interview is that...I get to hear...what you think is important." Nevertheless, I want to call attention to how Cpt. Lynch paused when confronted with the complexity of selecting a concept that could adequately describe the ways cognitive, physical, and communicative processes are organically linked on the fireground, because it was through reflecting on exactly this moment that I came to hear that participants were not telling me *that* their multimodal literacies mattered, but rather emphasizing *how* they mattered.

Thereafter, it was evident to me that participants understood these multimodal literacy practices as imbricated within and central to the physical labor that they perform. Instead of seeing the types of "reading and writing" they perform as isolated practices

separate from the *work* they undertake, they understood their literacy practices as critical components of *firefighting*. Moreover, because firefighters regularly work in environments where smoke, noise, risk, and unpredictability are present—factors which would exert a considerable strain on normative workplace literacies—it appeared grossly unremarkable to participants that they directed my attention to the sophisticated ways that they and others marshaled kinesthetic, tactile, visual, aural, oral, spatial, and/or alphabetic-numeric modalities in order to construct and communicate knowledge. Indeed, their lives depend on their ability to understand how to leverage a full spectrum of semiotic resources if, and when, they might be needed. Pulling no punches, participants sketched rich and layered accounts of work that accentuated how multimodal literacy practices contributed to the success of larger rhetorical aims like promoting workplace safety, restoring order to the chaos of a tragic emergency scene, and/or instilling confidence and trust in co-workers.

In order to honor the bravery and trust they bestowed me with, participants were assigned pseudonyms so that their words might figure with the raw and unsterilized candor that I have come to understand as a, if not the, quintessential characteristic of the fire service. To further honor their straightforwardness, I have structured this chapter around three of the major themes that emerged by open coding (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1998) their descriptions of how fireground communications, writing, reading, and tool use figured within work activities: situated uses of multimodal genres; agency and constraint; and rhetorical distancing.

Situated uses of multimodal literacies:

Interpenetrated, hierarchically contingent, and ad hoc genres

Within their descriptions of work, firefighters frequently drew attention to the ways that they marshaled and combined kinesthetic, tactile, aural, oral, visual, spatial, architectural, and alpha-numeric modalities to "read and write" on firegrounds. After an initial round of coding and accounting for these modalities, I performed a second round of coding to identify relationships between the modalities and work practices. One theme that emerged within their descriptions was that participants had established consistent combinations of these modalities that they, in turn, utilized to respond to communicative and epistemic needs situated within specific work activities. For example, firefighters noted that the *360* (kinesthetic, visual, oral radio)—a literacy practice involving both a reading component (whereby a firefighter walks completely around a structure in order to visually identify (1) areas where victims might be trapped, (2) the origin/pockets of fire, (3) its progression through the rest of the structure, (4) immediate risks to firefighting personnel (e.g., collapse, flashover, backdraft), and/or (5) unique architectural features that might impact fire behavior) and a writing component (whereby s/he relays her findings to other personnel on scene via a portable radio)—was a practice situated exclusively on firegrounds. That is to say, firefighters characterized their semiotic practices as multimodal genres, which rhetorical theorist Carolyn R. Miller (1984) so famously defined as "typified rhetorical actions based in recurrent situations" (1984, p. 159). In this section, I explore three distinguishing features of firefighters' situated use of these multimodal literacies. Specifically, I attend to the ways that participants described multimodal genres as interpenetrated, contextually contingent, or ad hoc.

Multimodal genres are interpenetrated

One characteristic of the situated use of literacy practices was that firefighters frequently noted that genres were packed into dense formations and that they tended to interpenetrate and/or overlap one another. The first example derives from a collaboratively stitched recollection of the work that members of Massachaug Fire Department (MFD) carried out at a well involved structure fire, but hones in on an excerpt wherein Lt. Maynard chronicled his actions and thoughts between the initial report of the alarm and he and other units began to arrive on scene. What I want to direct readers' attention to is both the vast array of multimodal genres that are brought to bear on the information needs that Lt. Maynard confronted as the officer of a first arriving engine company and the proximity of these genres to one another in use:

> Lt. Maynard: Brand new black shield. And, James [Crawford], and another firefighter were on the truck company. The thing that sucks about having calls so close is that you don't necessarily have a chance to get fully prepared. *Ugh*. You're piecing stuff together as you show up. Rolling up, we're dispatched to a reported structure fire. Half way down Dorland Drive, you can smell something's burning somewhere, so you have a pretty good idea you're actually going to work. Turn down Rose Pond Avenue onto Spring Grass Road, [I] see smoke across the road, then, you *know*, you're going to work.

In this account Lt. Maynard began by listing firefighters who were assigned to the initial arriving units. Note that as he made mention of these firefighters, he designated one as a "brand new black shield," signaling attention to the rhetorical work that the piece of safety clothing performs as a distinct genre for identifying the firefighter (visual; alpha-

numeric; temporal). This distinction is powerful and worth further attention for a number of reasons that are worth mentioning. First, in this situated use, Lt. Maynard deployed the genre to indicate that one firefighter assigned to the truck was inexperienced, having recently completed a probationary period. Second, this situated use demonstrated the way in which Lt. Maynard supplied two types of tacit knowledge necessary to construct a reading of the genre: (1) the lieutenant understood that shield color has a functional meaning within that genre (e.g., whereas a probationary member might wear a red, blue, and/or orange shield, a firefighter ranking private wears a black shield); (2) the lieutenant had experiential knowledge of that *when* this specific firefighter had began to wear that genre (e.g., recently). Third, at a symbolic level, the lieutenant perceived the firefighter *as the genre* within this moment in time. From a rhetorical perspective, then, Lt. Maynard had drawn subtle attention to the difference between the *situated ethos* and the *constructed ethos* of this firefighter. For Lt. Maynard, s/he possessed the situated ethos that is institutionally bestowed to a firefighter holding the rank of private—symbolically and textually inscribed within various cultural artifacts such as the color of the shield—but that firefighter had not yet built or constructed an ethos which the officer considered commensurate to the level of a full-fledged, black shield.

After taking stock of the other two firefighters assigned to the truck company, Lt. Maynard turned toward explaining contextual factors that impacted this particular "call." Here he pointed out that this report of a structure fire (oral, aural, radio) was positioned in space and time in such a way that it posed a challenge to responding units. That is, as an individuated version of a broader genre, this report constellated and brought together three distinct physical locations: the physical location of the structure fire, the dispatch

center, and the physical location of the MFD. What made this report significant was that it illuminated a unique rhetorical problem firefighters from MFD regularly encounter. Namely, their jurisdiction is geographically small (one square mile) but densely populated (nearly, 20,000 reside in the village of Massachaug), so there is often not enough time "to get fully prepared" (...). The ambiguity of this concluding statement is fascinating, as it could simultaneously refer to cognitive, psychological, and/or physical work that firefighters perform while en route to alarms.

In this case, two clues seem to indicate that Lt. Maynard was referring to cognitive work. First, as a lieutenant, he is considered a member of the command staff. If Lt. Maynard had arrived on scene first and assumed command of the scene, he would have been responsible for that scene until a senior ranking officer arrived and command had been formally transferred. Consequently, this is a probability that he might have been devising a strategy for the alarm in case he was thrust into that role. Second, the sketch of the work performed while "rolling up" (responding and arriving on scene) revealed the presence of a distinct cognitive practice that marshaled olfactory and visual information to evaluate the credence of the initial report. Note how changes in proximity influenced the sequence and modalities by which Lt. Maynard received information about the structure fire. First, Lt. Maynard is alerted to the alarm by the dispatcher's report at the station, but as the engine he is riding approaches the scene he transitioned to making his own observations. On Dorland Drive, he reported smelling the fire; and, as he turned onto Spring Grass Road, where the structure was located, he saw smoke. Three aspects of this process description are significant: (1) These distinct data sets interpenetrated one other (dispatcher's report, smell of smoke, sight of smoke); (2) Though they interpenetrated

one another, each remained viable streams of information, but moved from the foreground to the background as new information emerged; (3) As each distinct data stream became available to Lt. Maynard, he assigned increasing levels of cognitive certainty to the veracity of the initial report: what began as a report became an idea and culminated as knowledge.

As units approached the scene, units observed visual cues that fortified their realization that they were confronting a legitimate fire. While Lt. Maynard continued to hold the stage, other firefighters offered bits of information that supplemented or filled in portions of his account.

Ff. Crawford: People in the road.

Lt. Maynard: People in the road.

Ff. Jordan: As one of the few calls I've been to where...

Lt. Maynard: It's just classic. There are people in the front yard waving their hands, and you're like—"*Oh shit. Here we go.*"

Lt. O'Rourke: Ding dong. Game on.

Lt. Maynard: Yep. Ding, dong. Game on. Truck company gave a size up, I trust that it was a decent size up. I had totally zoned out.

Me: Were you doing you own size up?

Lt. Maynard: I was doing my own. Once I knew, as the engine officer that I was going to work, the check list started going down. Got out. Filtering extraneous information. I was looking at the building; looking at people outside; Grab my TIC [thermal imaging camera], turn around to [Riley] who's my knob [nozzle operator], *"grab the inch and three-quarter [hoseline] and meet me at the front*

door," so I meet up with Lieutenant [Bray] who was surprisingly calm, thank god, telling me [it] started in the basement. *Take me to the basement."* Takes me around to the back of the house and there's—just thick—black, brown, chunky, nasty smoke.

Ff. Crawford: It was chunky.

Lt. Maynard: Just pushing out of the basement, like, "*oh shit."*

Ff. Crawford: When you pulled up the front door was open.

Lt. Maynard: Smoke was pushing.

Ff. Crawford: Smoke was probably close to half way down [to the floor].

In their recollection, Lt. Maynard, Lt. O'Rourke, Ff. Crawford, and Ff. Jordan emphasized that they drew from oral, aural, visual, olfactory, spatial, temporal, geographic, color, alpha-numeric, gestural, and kinesthetic modalities to construct genres capable of responding to their needs of technical communicators. Yet, there is more to this account, as it illuminates the mediational and communicative relationships that exist between genres as they are organized and deployed as multimodal literacy practices.

According to Clay Spinuzzi, William Hart-Davidson, and Mark Zachry (2006) communication and mediation are two distinct "ways to understand how [humans] interact with texts" (p. 43). Whereas Spinuzzi, Hart-Davidson, and Zachry define communication as "the transactional, intersubjective exchange of information, thoughts, writing, or speech amount participants," they frame mediation as "activity that [is] neither serial, nor explicit, nor necessarily even interpersonal" (p. 43). Here I want to emphasize an important conceptual distinction: genres are mediational or communicative to the extent that they enable humans, as end-users, to orient them toward these aims. Just as

reading and writing function as concomitant processes—rather than binary poles—so, too, function genres which enable rhetors to realize epistemic aims through the mediational and/or communicative work they fulfill. Still, whereas mediational genres are not exclusively wielded at an internal level—though a great many are—the transactional nature of communicative genres seems to posit that they must necessarily function in externalized fashion. Even more, many genres appear to be oriented toward both aims, although in slightly different ways and at slightly different times.

Returning to Lt. Maynard' account of his arrival on scene, note the sophistication with which he indicated subtle cognitive shifts while switching between, and perhaps even simultaneously wielding, genres and practices to realize the communicative and mediational aims he pursued. Specifically, he noted (1) filtering and/or (2) completely blocking the reception of data streams coming from communicative genres such as the (a) size-up given by the ladder company (oral, radio) ("I trust that it was a decent size up. I had totally zoned out."). What is significant about these (1) filtering / (2) blocking practices is that it not only enabled Lt. Maynard to (3) construct an independent assessment of the scene—(b) a mediational version of the size-up that is directed toward individualized epistemic aims—but also that this interiorized genre culled together a number of subordinate interpretive genres such as (c) reading smoke (visual, color), (d) observing people, behavior, and body language (visual, gesture, kinesthetic, spatial), and (e) scanning the construction and architecture of the structure (visual, spatial, architectural, cognitive). Once the task of constructing that genre was complete, Lt. Maynard described a subsequent practice (4) by which he combined the (b) size-up with an (f) cognitive heuristic (check list) that enabled him to organize, prioritize, and plan his

ensuring actions before (5) issuing a communicative genre, (f) an order (oral) for Riley to meet him in specific location with a specific piece of equipment, and finally (6) returning to his interiorized practices (1, 2, 3, 4).

Indubitably, the uses of genre discussed within just this brief excerpt suggest that there are three ways aspects of firefighters' situated multimodal literacies that rose to the surface. First, in this account firefighters drew from an expansive range of semiotic resources to construct genres and were surrounded by a range of genres that materialized in a variety of modal configurations. Second, in this account the sequencing and proximity of genres had a significant impact on firefighters' work activities. Third, these genres interpenetrated one another, destabilizing, supporting, and/or supplementing the information contained in genres which preceded them. It is worth considering these findings as I move forward to explore two more ways that situated uses of genre appeared significant.

Multimodal genres are tied to rank

While firefighters' situated uses of multimodal literacy practices revealed that genres were often interpenetrating, it was also clear that these uses of multimodal literacy practices were also contextually contingent. That is to say that even within remarkably similar contexts—wherein firefighters orchestrated similar groups of genres in consistent ways—there were still significant differences in how genres were utilized. These differences, then, demarcate the areas of contingency and instability within approaches that otherwise appear to be standardized. To explore this, I have selected an excerpt from an interview wherein Chief Burke traced the steps he followed between receiving an alarm and arriving on scene. In other words, I selected a description that shares the same

contextual parameters as the example in the preceding section in order to generate useful discussion between the two accounts. As the example will show, Chief Burke enumerated uses of aural, visual, oral, and spatial genres that are extraordinarily similar to those that Lt. Maynard had mentioned. Still, Chief Burke's indicated that he also drew from larger bank of genres, and that the scope of his bank of genres seemed related to the decisions he must make in his capacity as the top-ranking member of command in his department. Like Lt. Maynard, he began by providing background information related to his response:

> Chief Burke: When I receive an alarm, it's not that I'm at the station, and I have someone to drive me. I have to drive myself to the alarm. So I'm thinking about the building, if I know it. If it's a residential structure, I'm trying to figure out the lay of the land, the area that they're in, what kind of building it would be in, wood frame, the different areas of the building, the weather conditions, are the trucks going to be able to get out? Is it warm? Is it cold? Snow in the way [or] ice in the way it's going to take us a while. Listening to the trucks sign on to see what they have for manpower whether I need more help or not. Unfortunately the dispatching isn't all that good...that they say, well, we now received another call that the fire, that there is smoke showing ... sometimes we get that; sometimes we don't. If we go to a place we go to a lot, you're thinking about—ok, unfortunately you go there to a lot of false alarms so the first thing that pops in your head is —another false alarm, but you can't do that. You have to be thinking ok where's it [911 call/information/dispatch] coming from? Did they call? Did the police station dispatch call us after they called? So you gotta call dispatch, "yes they

did call; they have this/that" so now you kind of have to figure out where it is you're driving to.

Immediately, Chief Burke made mention of an identity feature that has a contextual impact on his response in comparison to other firefighters. Whereas firefighters within his jurisdiction are either stationed at a department and/or drive to the station to respond to ride on a piece of apparatus to an alarm, he must independently drive and navigate himself to the location. For Lt. Maynard, in comparison, a chauffeur or engineer is responsible for this task. From a rhetorical perspective, the situated ethos associated with each of these firefighters' ranks functioned as an identity feature that differently incorporated each firefighter into a socio-technical context. In this case, the exigency motivating their responses was consistent (each had been responding to a report of an alarm), but Lt. Maynard assumed the riding position of an officer on an engine while Chief Burke had to shuttle himself to the alarm.

Because Chief Burke drove he had to interact with a range of multimodal literacy practices and genres associated with this task—processing traffic signals and road signs, estimating speeds and distances, kinesthetically interfacing with and receiving tactile feedback from the steering wheel, seat, seatbelt tensioning device, gas and brake pedals, monitoring gauges on the dash display, operating the siren and emergency lights, and recalling geographic knowledge.[22] Lt. Maynard might have opted to use some of these literacy practices and genres (e.g., operating the siren; reading speed limits), but others were excluded from his available genre stream due from his position in the officer's seat on the first due engine (e.g., kinesthetically interfacing with and receiving tactile

[22] While we might infer Chief Burke utilized these literacy practices, they were omitted from his actual account. Still, they helpfully illuminate differences in each firefighters' genre stream.

feedback from the steering wheel). Simply put, each was afforded a differential level of access to specific technologies, physical locations, and tools (including genres) that were contextually contingent to the ranks of Lt. Maynard and Chief Burke held: as the officer of an engine company, Lt. Maynard was prescribed a specific riding position on a distinct piece of apparatus that differed from that of Chief Burke, the commander of an entire department.

Digging deeper into the contextual contingency of Lt. Maynard and Chief Burke's use of planning genres, take note of differences between their descriptions of when and how each initiated this cognitive process[23]. Specifically, I want to direct attention to how each firefighter revealed that he had (1) used distinct strategies for incorporating planning genres within their response processes and (2) planned at a level scope commensurate to his respective rank. Whereas Lt. Maynard is directly responsible for planning tactics for his unit, Chief Burke is directly responsible for planning a strategy for the entire department's response. As a result, Lt. Maynard's account of the rhetorical work he performed en route was mainly concerned with identifying who was present on apparatus and sussing out the probability that the alarm was founded. It was not until he arrived on scene that he shifted to the mediational genres he used to size up and devise a plan for his crew. In comparison, Chief Burke initiated his planning process immediately. While Chief Burke did not directly mention the presence of a mediational genre, like Lt. Maynard's heuristic "check list," Chief Burke's description included evidence of such a genre. For instance, once he had identified the location of the alarm (experiential, spatial,

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[23] It is important to note that this analysis surrounds descriptions of internalized mediational processes, so it is difficulty to fully grasp the cognitive complexity of these firefighters' processes or whether these descriptions are accurate portrayals of such processes. Still, the presence of substantive differences in the descriptions alone is worth discussing.

cognitive), he considered life safety risks associated with the structure (experiential, architectural, cognitive), and hypothesized if the environment and weather could adversely impact response times of incoming units (cognitive, spatial, temporal visual) or shorten the ability of personnel to usefully operate on scene (visual, cognitive, temporal). Thereafter, he calculated if enough resources and personnel were available as units signed on the radio (oral, aural), thought through whether or not to strike an additional alarm, and remarked that he often has to radio the dispatcher to probe for additional information (oral, radio). Strategically, Chief Burke's description revealed a more proactive approach, as he sought out information rather than reacting to it as Lt. Maynard had.

Before moving on, there is one more aspect of Chief Burke's account worth mentioning. In his description he omitted direct mention of nearly all of the literacies and mediational work associated with safely and quickly navigating his command vehicle to an emergency scene. Additionally, the communicational genres he used to coordinate the response with incoming the units and dispatch through radio communications occupied a minor place within his account of the cognitive and rhetorical work he performed. This suggested that Chief Burke may have prioritized and foregrounded the cognitive work of recalling and processing geographic, experiential, and architectural knowledge to construct mediational genres necessary for planning a response,while the other mediational (e.g., speedometer; road signs) and communicative (e.g., units signing on; requests for information) moved in and out of the foreground more rapidly.[24]

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[24] Within New England there are geographical areas where it is common to find older and newer construction. Based on this geographical knowledge, firefighters are often able to draw inferences about the methods of construction (e.g., post and beam, brick and mortar, balloon frame) common to that geographical location. Knowledge of building construction is important to firefighting because it impacts the ways that fire spreads and behaves in structures, and impacts the strategies that are used to mitigate the damaging effects of fire.

In sum, there were a range of ways in which contextual contingencies impacted how these two firefighters' incorporated different genres into their processes. Specifically, their accounts suggested that aspects such as rank, scope of responsibility, identity, distance to the scene, time to prepare, and experiential knowledge have a powerful influence on the genres that firefighters might bring to bear on rhetorical situations. Next, I consider the ways that *ad hoc* uses of genres emerged.

Multimodal genres are used in ad hoc fashion

Here I discuss four examples of the ways that participants revealed utilizing *ad hoc genres* within situated multimodal literacy practices. *Ad hoc genre* is a concept that Elmar Hashimov and Brian McNely (2012) coined to discuss individuated uses of tools within work ecologies. Examining the composing practices of a group of college students who were constructing a collaborative transmedia project, Hashimov and McNely discovered that participants had "devised [genres] for [responding to] a particular purpose at a particular time" (p. 255). In other words, they weren't observing random uses of tools, but instead "idiosyncratic ways" that participants had "adapt[ed] [tools] to the changing expectations of the class" (p. 255). Like participants within Hashimov and McNely's study, interview participants recounted examples of *ad hoc* genres developed for responding to unique situations. Captain Lynch, for example, described "a trick" that he had utilized to temper his excitement and anxiety while responding to an alarm:

> You have to be calm and collective and if you're take a deep breath. I've always, for the longest time, I don't need do it anymore, but one of my tricks to always —to make sure that I never got nervous—was I used to when the tones came in for something that came in good, I'd pop gum in my mouth and I don't know why

> I always did I don't need to do it anymore but I'll tell ya for probably almost 12 years it was always a little joke certain people knew it but I would just put gum in my mouth and I would just chew gum going to the call. And, I just knew when I put gum in my mouth.

Cpt. Lynch's description of chewing gum is notable because he recognized this kinesthetic practice as a regularized component of composing his emotional response to the exigency of being thrust rapidly into an emergency. That is to say, through regularly engaging in the monotonous, orderly, self-contained practice of chewing gum he constructed a symbolic *ad hoc* genre for self-actualizing while confronting the uncertainty and chaos of a fireground.

This wasn't the only ad hoc genre that Cpt. Lynch mentioned using. In fact, he described regularly using three mediational genres to reflect on his work. It was clear that he was proud of these practices, and believed that they had helped him to become a successful communicator, firefighter, and leader: "[Reflection] That's what made me so much better I think. There's no doubt." First, Cpt. Walsh mentioned that he maintained "a log book" of the alarms to which he had responded (visual; alpha-numeric):

> I've been in the city for about 26 years. And I've always kept a running log book. Probably one of the only ones that keep a running log book of every run I ever did, and I write notes about it. I've always done it since I came on 26 years ago. Every run is in my log book. And I write down all my runs and then I categorize them for my own training, so I can always go back every six months and say. Oh, I remember this fire and then I write down little specific things about that I always keep in mind.

What I want to direct attention to is not the uniqueness of this ad hoc genre, but rather the complex reflective practices which surrounded how Cpt. Lynch used this genre. Not only did Cpt. Lynch store information in the log book, but he utilized the genre as a database. In this account, he mentioned that he actively coded the information contained in the log book ("I categorize them"). Thereafter, he would periodically return to the data in order to detect trends, recall knowledge, and take mental notes. Briefly moving away from his description of the log book, he pointed out that at some point in his career he supplemented this reflective practice with an additional set of information he gathered using his cell phone (aural, oral, digital):

> [W]hen the advent of phones came on—where you could start recording some things—I would record, code—working fires—to see what I could pick up [and] to see...if I would change things and listen to other people...

Note that, just like his use of the log book, he described using this technology to not only record fireground communications, but also construct a mediational genre whereby he could critically reflect upon the choices others had made. Still further, he envisioned himself within that specific rhetorical situation in order to consider the choices he might have made differently. He, then, provided a specific example of how he used this genre to identify terminology and language to employ within his own radio communications:

> We have many people who pull up on the scenes [of a] three story wood frame, they're gonna pull up and just say "Engine 1, Code Red." Which is in the City of [Millwick] isjust a working fire, and that's how we did it back—many years ago. Actually, it wasn't called code red. It was called 10-26. As you know, with the Incident Command System, we've gotten away from using...our own terminology

> to a standard that we all follow. Plain language. So, over the years, I've tried to pick up communications methods that make me listen in and decide this is how I want to do it.

Again, I want to draw attention to the rhetorical work that Cpt. Lynch is performing with by using a mediational genre. In this case, Cpt. Lynch deployed the recordings as a heuristic for either discovering "communication methods" that others have used, and/or inventing his own by revising, adapting, or building upon their approaches ("[I listen to other people"; "[I] decide this is how I want to do it"; "to see what I could pick up and to see...if I would change things"). Yet, this description also illustrated another dimension in how Cpt. Lynch drew upon this mediational genre. Through the process of recording fireground communications, these communicative genres are subsumed within the mediational genre. As such, they became one distinct data set that Cpt. Lynch had available for indexing his rich awareness of the past.

This awareness is exemplified within his account of the ways the size-up (visual, radio, oral, aural)—a communicative genre—has been deployed differently by firefighters within the City of Millwick at different times within his career. At one time, a firefighter called a "10-26" to report a working structure fire within their size-up, but after the federal government introduced a subsequent mediational genre—the National Incident Management System (NIMS/ICS)—the firefighters reported these incidents as a "code red." His account not only reinforces the degree to which genres interpenetrate one another on firegrounds, but also the degree to which genres are subject to contextual contingencies. In fact, this interpenetration extended into these two ad hoc, reflective

genres which have, arguably, helped Cpt. Lynch to construct a working memory of notable shifts within the fireservice, as I'll now discuss.

In the account he offered, it is evident that at some point Cpt. Lynch introduced a new tool, a cell phone, into the already existing reflective practice. And, as he realized the value of this technology, he noted that he began utilizing it more frequently:

> And then it became every working fire, now I would go out of my way to go up to fire alarm afterwards and record it. And, I would record it so I would always remember it. And, every once in a while if I read something in my book, I'd say ok let me listen and make sure that's what I said. I mean, for example, I pull up to a scene of a four story building. I remember one of them, I said it was a three-story building. I know it was four because I pull up engine, four. But why did I say three? Why am I communicating three? So I always keep that in mind now.

This is a significant statement because it shows that when Cpt. Lynch introduced an emergent genre into an existing process it altered the existing process. Within his previous examples, Cpt. Lynch noted that he would enter data into the log book and analyze it and that he would record other firefighters' radio communications and analyze those. This last section of his description differed because it revealed that he discovered a way to synchronize these genres to realize yet another aim: critiquing his own communications practices. By comparing the audio recordings to the information in his log book, Cpt. Lynch constructed a hybrid mediational heuristic that promoted a critical self-awareness of the exteriorized genres associated with speaking on the radio. This new

knowledge, in other words, enabled him to think differently about the ways in which he utilized communicative genres in practice ("I always keep that in mind now").

Accounting for multimodal genres in pathos laden situations: Discursivity, interruption, and humor

Recently, a friend who teaches and leads a technical rescue team that I study rope rescue with shared a metaphor for developing comfort working at height with me—he understands that I find rescue rope to be a terrifying activity. "Be the duck," he explained. I replied, "I don't understand?" "You are where you are supposed to be," he stated. I thought about it for a minute. "Can you explain?" "Yes. A duck can be moving a million miles an hour underwater, but on the surface it appears effortless and calm. A duck doesn't care where it is. It is where it is supposed to be." He repeated, "be the duck." Like Cpt. Lynch's use of gum chewing as a practice for managing emotions while responding to emergency scenes, this metaphor illuminates that stoicism is a valued attribute within the fireservice. Yet, what is most unique about these accounts is that each frame stoicism not as the absence of emotion, but rather as a display of an absence of emotion.

In this section, I delve into the ways in which firefighters—lauded socially for their ability to "put a cap on it" and do work that is necessary when needed—described their work as thoroughly laden with pathos. Perhaps it is because I am also a firefighter, but at the time of the interviews I felt participants had offered particularly candid accounts of their work. That is to say, I remember specific moments within the interviews that seemed particularly arresting. Yet, as I began to code the interviews, I realized that participants' descriptions of their multimodal literacy practices not only intersected with

pathos more frequently than I had anticipated, but also that specific practices recurrently intersected with *pathos* in ways that I had not anticipated.[25] To some degree, this is to be expected because *pathos,* as Annis Barwarshi (2012) explained, is a powerful dimension of the rhetorical work that genres perform as "sites of invention":

> [G]enres serve as the typified and situated topoi within which individuals acquire, negotiate, and articulate desires, commitments, and methods of inquiry to help them act in a given situation, thereby inventing not only certain lines of argument (logos), but also certain subjectivities (ethos...) and certain ways of relating to others (pathos...). (p. 209)

In the following sections, then, we begin to see how firefighters leveraged genres to help one another save face, to construct authority and good will, and we see that there are logics built into genres that bestow them with considerable affective longevity.

Affective longevity

One of the most conspicuous accounts of the way with which mulitmodal genres intersected with pathos emerged when Deputy Chief Kelly recounted actions that he and crews undertook at a structure fire where there had been a report of victims trapped. Upon receiving dispatch's initial report (aural, oral, radio) of the fire, Dc. Kelly noted that the information contained within this genre prompted an intense emotional response that changed his "frame":

> When the call came in it came in, it came in for a structure fire with a woman and child trapped inside. So that kind of gets your emotions going a little bit—gets

[25] In fact, writing this section of the chapter opened up a window of understanding the interrelationship of pathos and firefighting that I, myself, had not been aware. I have found writing this section of this chapter both troubling and rewarding—in a positive, productive sense—in that it has offered me a new way of reflecting and practicing my work as a firefighter.

> your frame in a little bit of a different place. I was in early right behind the first engine, so I hooked up with the engine, the first crew going in—and chief, chief, had command so.

What is remarkable in this description is that Dc. Kelly does not block or ignore his pathetic response he felt, but instead frames it as an influential aspect of the rhetorical situation that channeled in order to construct an appropriate response. Arriving on scene, Dc. Kelly quickly donned his gear and linked up with a search crew. But, as they performed their search for the victims, they encountered a physical object which suggested that "something was wrong"— that they were likely dealing with an arson fire that had been deliberately set:

> I was right behind, I scotted up, masked up, went in, and the guys in front of me passed back a jug of...an empty gas can. So, I just kind of passed it over my head and passed it outside. Didn't think much of it, cause our mission was the life safety; we were looking for the mother and child. So we searched the building, and we came across another gas can, so we just passed that off to the side and continued the search.

Note that Dc. Kelly assigned a different level of priority to the visual and tactile information that he and crews encountered—clues they were working in an unpredictable and dangerous environment—as they began their search, in comparison to the information associated with the initial report, which he assigned a high priority and held in the foreground of his mind. This is significant because while he engaged in a pathetic response to the initial report, his subsequent responses to information are more reasoned and clinical ("our mission was life safety"). Just as he and crews physically "passed [the

gas cans] off to the side," so to did crews discard the information tied to the can in order to focus exclusively on the aim of locating the child and mother ("didn't think much of it"). He and crews continued the search:

> And that—those conditions there was a lot of visibility—there was lot of fire. The fire was kind of spread around the house. I wasn't thinking arson right away, but the clues were there that something was wrong. But my mind was focused on the life safety of the mother and child, so we searched the whole house. Primary search of the first floor and the second floor. Nothing.

Take note that while Dc. Kelly described reading fire behavior (visual; space; movement) in order to glean information about the fire ("there was a lot of visibility—there was a lot of fire. The fire was kind of spread around the house"), he again set that information aside to pursue his chief goal of locating the victims ("my mind was focused on the life safety of the mother and child"). But, when his crew completed the search, the findings suggested that the victims were not present. Unhappy with the results, Dc. Kelly ordered the crew to repeat the search:

> And, ugh, still the visibility was good, and I just told the guys search it again, go again, search everywhere. So they searched the second floor, and the fire started building a bit more, went down searched the first floor. Every nook and cranny was searched and the primary, we were going into a more of a secondary search.

Based on Dc. Kelly's description, it appears that the firefighters had the ability to both visually and tactilely confirm that no victims were present. Still, what I find most striking about this description is that, once again, Dc. Kelly described discarding these findings, as well as physical evidence that interior conditions were deteriorating ("the fire started

building"), in order to concentrate on finding the victims. Confronting the dissonance between the dispatch's initial report (aural, oral, radio) and the findings of a physical search (visual, kinesthetic, spatial, tactile), it is clear but not surprising that Dc. Kelly prioritized the former given the stakes.

Continuing his recollection, he noted that the completed a second search of the building, which, again, turned up negative results. Still wrestling with the initial report, he ordered a third search:

> But I just didn't feel comfortable, so I sent them a third time. I said, "search it again." And then I reported out that there was no one in the building. I was certain there was no one in the building. When we did come out, I had a face to face with command and again I just was... it was not a good feeling that I had... I know we searched that house, I knew that nobody was in there but I still had reports of the mother and child being in there so I was questioning myself....

Looking across these excerpts, I want to underscore the relationship between how Dc. Kelly assigned different weight to information based on modalities through which it circulated and/or was constructed. As discussed above, the initial dispatch report exerted great pathetic force on the rhetorical situation because of the content within that report. Yet, in this last section, it appears that Dc. Kelly seemed to consider a genre's modality as a factor that also contributed to his pathetic response. Though his crew had performed three separate searches of the structure (kinesthetic, visual, tactile, spatial), he indicated that he was still skeptical of the findings they had produced. That is to say, whereas the initial report contained in radio message—a communicative genre—functioned as an official statement which exerted great discursive weight on the fireground (victims are

trapped in the building), the mediational genres associated with the firefighters' visual, kinesthetic, and tactile search practices enabled the crew to construct knowledge and argue for a counter reality (there are no victims in the building). Still, this counter reality was authored with and through mediational genres that didn't carry the same discursive force. A single radio message (oral, aural, radio) evoked such powerful pathetic response that Dc. Kelly had difficulty allaying this feeling after three distinct "readings" of the structure. Even after exiting the building he still expressed feeling torn between what he *felt* and what he *knew* ("It was not a good feeling"; "I knew that nobody was in there"; "I was questioning myself"). In short, through discovering two contrastive possibilities—apprehended through and articulated within genres endowed with unequal discursive force—Dc. Kelly found himself positioned in an uncertain, pathetically fracturing relationship to segments of information with different epistemological force.

Reframing affect

Captain Lynch also drew attention to the ways multimodal genres functioned within a pathos laden situation. While working overtime on an engine company that he did not normally command, he was dispatched to a well involved structure fire with a crew that included Joe Magnani, a veteran firefighter from his department:

> There was a guy named, [Joe Magnani]. [Joe Magnani's] been on for 16 and a half years—16 and a half years [and] we get dispatched to a reported fire that is out in the projects—we have project in the city. [...] And, we come around the corner on [Hollowedge Boulevard] and this thing is just one big fireball coming, blowing out. Heavy black smoke, and it's a project house. [...] Get out of the truck. I turn around [to] the guy right there, and he's standing there with 16 years

> on the job. “Whaddaya want me to do?” “Pull a line,” I said. “Pull a line, I’m just gonna make sure to do a quick 360, make sure everyone’s out of the building.” He pulls a line. He gets a line and he puts it all on the doorstep. [...] I come around the corner. I said, “flake that all out. The fire’s on the second floor. We’re gonna advance it to the second floor.”

Describing their approach to the scene, Cpt. Lynch drew attention to both the color of the smoke (“heavy black smoke” and the velocity of the fire (“one big fireball...blowing out”). Bear in mind that these terms aren’t used for dramatic effect, but rather to indicate that it is visibly evident that they had rolled up to a structure which contained a significant fire load. With great subtlety, Cpt. Lynch pointed out that Joe was behaving oddly for a 16 year veteran. First, Joe asked what he should do, even though, as a veteran, he likely knew or should have known to grab a line. Next, instead of properly laying out the hose, he dropped it “all on the doorstep”—a rookie mistake that Cpt. Lynch had him fix. Retracing their actions as they were about the enter the structure, Cpt. Lynch described his surprise when Joe informed him of a detail he did not expect to learn:

> Ok, now, it’s zero. It’s heavy black smoke, already pushing out, and it’s already pushing down the stairwell. [...] We get in there. “You ready. Put your mask on,” I said. “You feel comfortable.” “Yeah, I’m all set.” He puts his mask on; I put my mask on. We’re at the door; we’re ready to go up the stairs. We go up about... now he puts his mask on. I go in a little bit behind him. He gets two steps up to me. He turns around to me...and he goes to me, “this is [the] first time [that] I’ve been first in. Just watch me.” Ok. Alright. I said, “Good to know. I wanted you to communicate to me that this was your first fire.” And, I’m saying to myself, *holy*

> *crap, 16 years on the job, this is the first time he's ever been first in!* He'd never been first in. He's been to a lot of fires. And he's been second in, third in, and he's pumped a lot. But, it was his first fire first in after 16 years, and he was scared shitless. And, I realized that when he had the balls to tell me, and I gave him credit. Listen, he could've just gone up there. He told me, this is my first one. And, it was a good fire.

Despite the contextual cues, Cpt. Lynch did not realize why Joe's behavior was off until the veteran shared a piece of information: "he'd never been first in." There are two aspects of this account that I want to draw attention to. First, Joe's message introduced a new pathetic dimension into the situation, which changed how Cpt. Lynch perceived the situation. His description demonstrated that he was absolutely shocked to learn that a veteran of 16 years had not been first in at a fire! And, second while inwardly amazed by this new detail ("I'm saying to myself"), Cpt. Lynch exteriorized a response to Joe that suggested that this information was not extraordinary ("Ok. Alright, I said. Good to know.)"

These statements are significant because as a leader, Cpt. Lynch not only responded in stride to the discovery of a piece of information that had a dynamic impact on his own stance toward the situation he encountered, but that also showed that he empathized with Joe's positionality: "I realized that [he was scared shitless] when he had the balls to tell me, and I gave him credit. " He then shifted from the recollection to make a distinction clear to me: "Listen, he could've just gone up there." Note that this distinction seemed to suggest that Cpt. Lynch believed that other firefighters might not have had the same courage which Joe displayed, the courage to speak up and share his

feelings. It also seemed to reveal that Joe trusted Cpt. Lynch. Returning to the story, Cpt. Lynch explained how this new piece of information altered the way he responded to the rhetorical situation:

> "Ok, no problem." I put my mask on. I say, "listen, I gave him the tap. We're going up the stairs, when we get to the top of the stairs"—and I'm trying to say this through the mask—"when we get to the top of the stairs"—and I'm trying [to get] as close as I can [to him]. "When we get to the top of the stairs, we're going to take a right." And, he went right up the stairs, and he took a right. And, he did what he was supposed to do. He came out after, and, oh, he says, "That was awesome."

In the excerpt above, take note of the way in which Cpt. Lynch strategically employed delicate oral and tactile messages as well as physical positioning to build Joe's confidence. First, Cpt. Lynch communicated to Joe that this new information is "no problem." Next, Cpt. Lynch used touch to physically reassure the firefighter that he was with him ("listen, I gave him the tap"). Thereafter, he provided Joe with a clear set of directions on what they were going to accomplish ("we're going up the stairs..."). When they began to work toward that objective, Cpt. Lynch reduced the physical space between him ("I'm trying [to get] as close as I can [to him]"), as a third way reassuring the firefighter that they would be alright. A pattern that emerges in this account is that Cpt. Lynch strategically integrated touch, talk, and space as a means of demonstrating empathy, altering his own stance toward Joe, and making it unmistakably clear to Joe that he was not alone, in order to reframe Joe's pathetic response to an unfamiliar situation.

Calming, coping, & distancing,

Throughout the interview, Cpt. Lynch repeatedly drew attention to how he used touch, speech, and space as important components of his rhetorical repertoire. In addition to using these genres as a way to identify with his crew members and instill confidence, he also described leveraging multimodal genres as a way of interrupting pathos laden situations. For instance, when confronted with difficult or intense situations, he explained that he regularly quoted a particular line from the film *Backdraft* as a joke that would help prepare firefighters for the challenge:

> I always tease the guys—it's we've been in a couple situations, where—to ease the tensions. We've opened the door to the apartment, and I know that my guys although they are senior, and I might even have a rookie.... I would always look at them and say, "dig in god damn it." [...] and they would all chuckle, and then we'd go in and put the fire out. But, it was just to communicate to them, I'm not worried about this situation.

While this example is similar to those in previous section—as Cpt. Lynch purposefully used it to build confidence in the firefighters—it operated slightly differently within this rhetorical context. That is, Cpt. Lynch realized that his crew was anxious about the situation they confronted, so he deployed this line as a way of interjecting humor into an otherwise serious situation. Note that the genre functions rhetorically in two significant ways. First, as a momentary interruption from the gravity of their work, the genre opened up a cathartic space within the situation wherein firefighters have an opportunity to release their emotion. Second, in outwardly performing this genre as the leader of the

crew, Cpt. Lynch leveraged his situated ethos to externalize to his crew that he is comfortable with what they are about to do.

Another compelling example of just how important these practices were for establishing rapport and trust came when Ff. Vincent Prior and Cpt. Lynch reflected on Vinny's first well involved structure fire in the city:

> Cpt. Lynch: Twelve noon. Pulled up. Report of a structure fire. Probably six or seven streets down from the station. [...] Came around the corner. Very large four family tenement. Heavy fire showing out the second floor, already into the other building. The exposure's on fire. So we don't just have our fire we [have] an exposure fire [too][26]. I get off the truck, and it's—it's just funny how it worked out. I got off the truck, and called on scene, reported what I had. I get off the truck. And, here's my backstep man, who is ready to go, who knows he needs to pull a line, he knows what he needs done, he knows his responsibility looks at me and says. [pauses] "Which house?"
>
> Ff. Prior: Which building do you want me to go to.
>
> Cpt. Lynch: Which house? Which house? Which building? And, it still—cause I remember to this day—we have fire going out everywhere. And, at a fire scene —he'll know I don't get rattled anyway—I put my arm around this guy, Tim, cause I knew we had a pretty serious situation. This is his first fire in this city. I know tenements. [...] I put my arm around him and I said, "no one has ever asked me that question before."

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[26] An exposure an object that because of its close proximity to a fire is directly exposed to radiational heat that is being given off by the primary fire. In some cases, an exposure will catch fire, and in others firefighters will use hosestreams to cool the object before it catches fire.

This example reinforces the finding that Cpt. Lynch regularly utilized specific multimodal practices as ways of responding to pathos laden situations by reframing his and others' emotional reactions toward those situations. Still, there are notable differences that make this example unique and worth discussing. Contextually, there are variables that make this distinct in that this example surrounds Vinny's first fire in the city and that Cpt. Lynch explicitly called out the magnitude of this incident as significant: "I knew we had a pretty serious situation." Yet, it is the way Cpt. Lynch wove touch, orality, and spatio-temporal factors into a distinct response to this situation that is so compelling. Confronted with two buildings simultaneously on fire, the rookie finds himself stumped, and asks a legitimate question: "Which house?" That is, Vinny directed Cpt. Lynch's attention to the rarity of the situation, wherein the leader pulled the rookie closer, momentarily paused to reflect on his experience, and, then, matter-of-factly delivered a quip with such understatement that it destabilized the gravity of the situation. Ff. Prior described how that act impacted him:

> It was huge. I was excited obviously. Getting off the truck, I see two very large houses, *RIPPIN*. D-side, B-side just—ffffpppppphhh [sound of intense fire —straight up. You can't see the rest of the house cause it's just smoke and fire, and I was like well they'reboth on fire, so I don't know what to do right now. [...] So, having that calmed me down enough to know this is what we're going to do. [...] He just kind of gave me the right direction.

Note that Vinny described feeling deep exhilaration at the moment, evidenced by his rich description and use of onomatopoeia of the fire consuming the structures. And, again,

note that he pointed out that as Cpt. Lynch's paused and responded to him, he was able to recollect himself and refocus on the task ahead.

In comparison to more light hearted forms of humor that show up on firegrounds, such as the way Cpt. Lynch's quoted lines from movies, drew firefighters closer, and utilized litotes to put those around him at ease, firefighters also offered descriptions that demonstrated they confronted complex emotions while responding to catastrophic events involving human loss and suffering. For example, while firefighters from the Massachaug Fire Department discussed inter-company rivalries associated with the different types of labor they are responsible for—engine companies advance the hose to the fire, truck or ladder companies perform search and ventilation, and rescue companies tend to primarily focus on vehicle and technical rescue—the discussion quickly took a serious turn as they began to recount a fatal and tragic accident that had occurred the year before:

> Lt. Maynard: Everybody hates rescue.
>
> Ff. Jordan: But we do all the cool shit
>
> Lt. Maynard: But we do all the cool shit, [so] everybody wants to be on the rescue when cool shit comes in.
>
> Lt. O'Rourke: Ehh. Not all the time....

What I want to draw attention to is that before the account evolved into a more serious reflection on the somber side of firefighting, Lt. O'Rouke challenged the statements of Ff. Jordan and Lt. Maynard who framed the work their company does as "cool." Instead, Lt. Maynard suggested that the work members of the rescue company take pride in is sometimes contrary to cool. While Lt. O'Rourke occupied a position of privilege as an officer, and thus, is able to broach this subject head on, he nevertheless displayed great

courage because—as will soon be clear—he opened a space in the conversation where he could articulate his emotions about this work in front of his peers and me, an interviewer, whom he did not know well at the time.

> Lt. Maynard: Just cause you're not exactly a rope rescue guru. Doesn't mean you don't want to be there when it goes down.
>
> Lt. O'Rourke. I'm perfectly fine with ropes. I just didn't want to be at the [semi- truck] thing cause that just....[sucked]
>
> Ff. Jordan: I wanted to be there and I had to go to work.

Here Lt. Maynard appeared to assume, given his own working knowledge with Lt. O'Rourke, that he was referring to a potential fear of heights or distrust of the work associated with rope rescue. But, O'Rourke owned his statement, and clarified which aspect of the work that he displeased. Specifically, Lt. O'Rourke disclosed that he would prefer not to have to work at incidents like "the [semi-truck] thing"—which happened to be a particularly gory motor vehicle incident. It is also worth noting that Lt. O'Rourke, who worked the incident, wished he hadn't been present, whereas Ff. Jordan, who did not work the incident, wished he had been present. Upon learning this, Lt. Maynard announced his disbelief, and launched into the type of gallows humor that those unfamiliar with the fireservice might otherwise consider inconsiderate or uncouth:

> Lt. Maynard: [Disbelief] How would you not want to be at the [semi-truck] thing? That was the greatest call we had last year.
>
> Lt. O'Rourke: Yeah, ok, I wanted to be there. I don't know.
>
> Lt. Maynard: A dude in a [compact car] went face to face with a [semi-truck] last year. That's awesome.

Ff. Jordan: Wow. Wow. Face to bumper.

Lt. Maynard: Face to bumper. Excuse me.

Lt. O'Rourke: Oh, that hurt.

Note that rather than having to explicate his sentiments further, Lt. O'Rourke changed his statement, acquiescing slightly, while still hedging "I don't know." Furthermore, observe the way in which Lt. Maynard and Ff. Jordan delved into a performative exchange downplaying the awfulness of the incident through hyperbole ("That was the greatest call we had last year") and ironic sarcasm ("That's awesome"), Lt. O'Rouke demonstrated that he is still shaken from the trauma of the incident "oh, that hurt." This exchange remarkably illustrates both the subjective double binds that firefighters inhabit as humans and emergency service workers who regularly confront traumatic situations, and a range of responses firefighters put toward it That is to say, as workers, emergency service workers firefighters take pride in their work and their ability to test their skills at challenging incidents, but the "greatest calls" are often the worst days of others' lives.

Consequently, as humans who empathize with these victims, it should come as no surprise that firefighters realize there is a difficulty in reconciling a passion for a job that so often coincides with human tragedy. From a rhetorical perspective, then, the performativity associated with Lt. Maynard and Ff. Jordan's statements might be read as two firefighters reaching for a degree of rhetorical agency over that complicated feeling. As a firefighter, myself, I understand that these types of statements appear unsympathetic, yet I also realize that these types of statements are reserved exclusively for those immersed within the customs and culture of the fireservice. If I had been a traditional researcher without my own ties to the fireservice—and even then, if I had failed to

construct credibility with these firefighters—it is unlikely that they would have been so forthwith about speaking in these terms. In fact, upon opening up this line of discussion, the firefighters promptly shifted gears in order to situate, on their own terms, how and why they understood this practice:

> Lt. Maynard: But, it kind of rolls right into the awkward side of firehouse communication. Cause instantaneously, after something catastrophic, we're making horrible, bad, off color jokes about it.
>
> Ff. Jordan: If any member of the public ever walked in....
>
> Lt. Maynard: It's some semblance of coping, some semblance of detachment. Within twenty minutes of being on scene at a guy who is DOA after going head to head with a [semi-truck]. Yeah, there are off color jokes being made: it happens.
>
> Ff. Crawford: Quietly, of course.
>
> Lt. Maynard: As long as no one else is around. And, there's that detachment while you're talking. That particular scene, we're doing a size up. I was the first arriving officer. The chief got there first, but I was the first company officer there. We're going around, it was already determined that the operator was DOA. The [semi-truck] operator had been transported for his minor injuries, and being shaken up. So, we're just starting to secure the scene, and someone's dropping speedy dry, and I'm like, hey dude, don't bother. What? That's not hydraulic fluid. Hugh? That's a river of blood. Oh. Shit. Alright. And, you just walk away. That shouldn't be normal, but that's an everyday conversation.

Paradoxically, their discussion demonstrates just how psychologically displacing firefighting can be. The firefighters understand that these practices are likely to be

constructed as “horrible, bad, and off color,” but as Lt. Maynard noted “it’s some semblance of coping, some semblance of detachment.” Yet, he quipped, “it happens.” At a personal level, I identify with their accounts, as I’ve found that during an incident it is easy to filter sensory stimuli, but afterwards, images, smells, and sounds begin to imprint, and humor is a way of interrupting that process and restoring a sense of order amidst a moment that is anything but. Note that Lt. Maynard, Ff. Jordan, and Ff. Crawford each drew attention to the fact that these are discreet practices that are closeted from the public (“If any member of the public ever walked in”; “Quietly, of course”; “As long as no one else is around”). Again, as Lt. Maynard remarked, “[the jokes] shouldn’t be normal,” but neither is being vested with the responsibility of consistently disentangle humans from predicaments.

Having described how this type of gallows humor functions, the firefighters at MFD, then, offered up an in-depth analysis of how rhetorical distancing enabled them to construct a frame through which they can encounter victims and trauma and continue on:

> Ff. Jordan: I think it’s just a way of separating yourself. It’s like anything else.
>
> Cpt. Gray: It takes the humanity out of it.
>
> Lt. Maynard: He’s not a person. We can’t look at him as a person.
>
> Lt. O’Rourke: ...It’s...you’ve gotta go out the door like... it’s you go to a medical... it’s not like oh this is, blah, blah, blah who’s connected to this blah, blah, blah who’s son of this person whether... its a person... who is.... You just look at it like it’s any problem with your car. There’s a problem.
>
> Ff. Smith: What’s broken with it, and how can I fix it?

Lt. O'Rourke: What's broken? What's telling me about it that's broken? What can I get from it that's tells me how to fix it? And if I can't figure it out, forward it up the chain right to the hospital. It's not. You have to like objectify the people you deal with, because when you run into shit like that you just have to kind of, ehh, whatever, just walk away.

Ff. Smith: You can't break down.

What I want to direct attention to is that while these descriptions are, indeed, objectifications of people, they function as a protective barrier that enables the firefighters to perform complicated high stress work and return to their subjectivities once the alarm had ended ("you can't break down"; '"you just have to kind of...just walk away"). Specifically, note that Lt. Maynard self-corrected himself while describing how he confronts victims ("He's not a person. We can't look at him as a person."). Note that Lt. O'Rourke diagnosing medical emergencies to figuring out "any problem with your car." And, note that Ff. Smith and Lt. O'Rourke utilized the work "it" to describe subjects. That is to say, the firefighters aren't simply objectifying subjects, but rather fabricating an objective lens whereby a fictional non-human value is temporarily assigned. In turn, this lens performs the rhetorical work of distancing the firefighter from the subject, so that s/he might filter out extraneous information in order to diagnose and remediate the underlying cause that has precipitated their presence ("What's broke and how do I fix it?").

Yet, as Lt. O'Rourke continued his description it became clear that he does perceive these victims as people—that his attempts to construct distance are partial and incomplete when reality sets it. Bravely, he and the other firefighters from MFD shared

how being exposed to these traumatic events—despite their best attempts to put distance between themselves and victims—do reside in their thoughts:

> Lt. O'Rourke: Because if you don't [distance yourself from it], it's going to dwell on you, when you're fucking sitting... If you think too much about it, you're going to be sitting in bed at night thinking...
>
> Ff. Smith: What could I have done.
>
> Lt. O'Rourke: What could I have done. Ever though there's nothing. You just have to accept the fact that it's, yep, yep, it's over. And, move on. Like we had. Last Valentine's day, the fucking Landwald Road. The girl... The guy that spun out.
>
> Ff. Jordan: Oh.... Yeah, yeah yeah. That was Valentine's day.
>
> Lt. O'Rourke: We all have our Valentine's day or whatever. Go down there, and fucking carnage. And, then you just come back, and get back in bed, and go to sleep. And, it just... it sucks. But, you can't fucking worry about it. And, there are people who ask—like other people I work with [...]—are like have you seen a dead body. And, you're like, yep. And, they're like *oooohhh*... It's like we're just so desensitized, too. It's just like nothing. It's like *ehh*... move on. I want to go home and go to bed now, and it's just the way it has to be. Otherwise you wouldn't last a month, if you couldn't.

Although Lt. O'Rourke's described the value and necessity of distancing, it is clear that he still thinks about the incident on Landwald Road, and even considers it as a way by which he identifies with other firefighters "we all have our Valentine's day." In a separate interview, Dc. Kelly also pointed out that carrying a maltese cross comes with a

psychological burden,"killing the victim lives with you forever[27]. You always second guess. Monday morning quarterback. [What] could you have done different?" Indeed, the presence of fillers such as "*ehhh,"* "yep, yep," and "fucking" appearing in Lt. O'Rourke's statement, for example, seemed to indicate that recalling the incident conjured up a variety of unsettled emotions including malaise, disbelief, and anger. Moreover, Lt. O'Rourke's statements reveal that firefighters have informal processes available to them for coping with, and responding to, the trauma they are exposed to as first responders. While the lieutenant clearly indicated that he does think about the incident, his statements revealed that the emotional buttresses which distance him from this incident are still to some extent active. Whether by joking about the incident with gallows humor, cursing about aspects of the incident, or acting as if the incident no longer impacts them, firefighters deploy these devices purposefully so that they might not only openly discuss trauma within a culture that closets emotion, but also claim ownership of trauma memories of the incident. Because firefighters are socially and culturally expected to maintain their composure amidst incredibly traumatic events, it comes as no surprise that formal processes for coping are eschewed.

[27] Maltese crosses have a rich history in the fireservice, but put simply they performa a symbolic function representing that the wearer is willing to trade her life so that another might live.

CHAPTER FIVE

A systems level view: Accounting for semiotic assemblages within genre ecologies

> "An assemblage, in its multiplicity, necessarily acts on semiotic flows, material flows, and social flows simultaneously..." (Deluze and Guattari, 1987, pp. 22-23)

> Because our body is involved in the perception of objects, it participates thereby in our knowing of all other things outside. Moreover, we keep expanding our body into the world, by assimilating it to it sets of particulars which we integrate into reasonable entities. (Polyani, 1966, p. 29)

***

It is a nondescript cold and grey day, in small city just north of Boston, Massachusetts two days before Christmas in 2011. A dispatcher receives a phone call for a reported structure fire in an Victorian era home converted into a multifamily apartment complex. Arriving on scene to smoke showing, an incident commander (IC) reports a working fire, and orders the first due engine company to stretch an attack line to the apartment on the second floor. A lieutenant and a firefighter from an engine company enter the structure with a handline to make a fire attack. As they make their way to the fire floor the lieutenant discovers that there are two apartments, and not one. Amidst poor visibility he becomes disoriented and attempts to enter an apartment across the hall from that where the fire is located, but finds that the door to the apartment is locked. Without a hand tool to force entry to the door, he decides to stretch the handline to the third floor for protection as he gets the ladder company to force entry to the door for him. At some point, the firefighter assigned to the lieutenant enters the apartment where the fire is alone; the lieutenant does not have accountability of his crew member, but does not realize this. The lieutenant returns to the fire floor and makes an attack on fire where the apartment is located—the apartment where his crew member is located. Incident command (IC) calls for a personnel accountability report. The lieutenant informs the IC

that his crew member is in the stairwell feeding him hose, but he is not. There are high heat conditions and the fire is rapidly deteriorating. There is a flashover within the apartment where the fire is located. The ladder company comes to the second floor and discovers the lieutenant from the engine company is on fire. A second engine company douses the firefighters, extinguishing the visible flames on them. They exit. The firefighter from the second engine company informs IC that he heard a PASS alarm sounding somewhere in the building. A mayday is not declared. A ten year veteran of the fireservice will not go home that day. A heart attack is listed as the cause his of death.[28]

***

In this chapter, I make use of a WAGR framework in order to account for the ways that firefighters' literacies were constellated across (1) subject positions, (2) tools (including material tools like axes, cognitive tools like heuristics, and genres which seem to straddle both cognitive and material realms), (3) object(ives) (including the object and aims that motivate the activity), (4) divisions of labor (including those that correspond to rank and occupational difference), (5) rules, and (6) communities. To do so, I made use of two analytical tools—activity system diagramming and genre ecology mapping—that borrow from and build upon Clay Spinuzzi's (2003) examination of the ways that Iowan public safety workers collaboratively constructed and communicated knowledge about traffic and motor vehicle accidents accidents using an array of genres surrounding a digital database (PC-ALAS). In that study, *Tracing Genres Across Organizations* (2003),

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[28] This vignette is culled from the National Institute for Occupational Safety and Health (NIOSH)'s (2012) "Career Firefighter Dies during Firefighting Operations at a Multifamily Residential Structure Fire," an after incident investigation conducted under the auspices of the agency's Congressionally mandated Firefighter Fatality Investigation Prevention Program (FFFIPP).

Spinuzzi offered a methodology that used activity system diagraming[29] [30] to take stock of the ways that literacies are enacted within practices that take place across three levels of organizational scope: macroscopic activities, mesoscopic, actions, and microscopic operations (pp. 42-47). Once he had identified different genres by "tracing" them (p. 4) across the activity system, he then mapped the genres using a technique he labeled *genre ecology diagrams* (p. 54) which enabled him to identify and analyze the ways in which the activity was "co-constituted" through literacies taking place across these levels of scope (p. 27).

Hereafter, I take up both of Spinuzzi's methods, but build upon the latter by taking stock of the ways that modality intersects with these genres. I've made use of and built upon Spinuzzi's tools for two reasons consistent with the larger aims of this study. First, while I believe a WAGR framework is theoretically flexible enough to account for multimodality—as outlined in Chapter 1—existing WAGR has primarily attended to the intersections of genres as they travel across digital and analog media. For example, Spinuzzi's (2003) map of the genre ecology surrounding the activity of locating and

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[29] WAGR is "a set of theoretical tools" (Spinuzzi, p. 367) that grew from rhetorical genre studies (RGS; see Barwarshi & Reiff, 2010) recently termed "writing, activity, and genre research (WAGR; Russell, 2009). Like Carolyn R. Miller, (1984) Charles Bazerman (1988), Carol Berkenkotter and Thomas Huckin (1995), Amy Devitt (2004), Aviva Freedman and Peter Medway (1994), and Cathryn Schryer (1993) a WAGR framework "understands genres as typified rhetorical actions based in recurrent situations" (Miller, p. 159). Both RGS and WAGR understand genre not as a formalist feature of a textual object, but rather as patterns of practice that emerge as humans orient symbolic tools in consistent ways within social activities that are culturally and historically situated. WAGR differs from RGS, as Brian McNely (2012) explained, in that scholars working within this empirical tradition turned to cultural historical activity theory (CHAT) because it offered "a way of viewing [genres as situated within] everyday human activity, with a corresponding framework and relatively stable nomenclature for understanding that activity" (McNely para. 5).

[30] Spinuzzi's use of activity system diagraming borrows from, and builds upon, the earlier work of third generation CHAT theorist Yrgö Engström (1987). Engström (1987) is credited as having recovered the theoretical tradition which was dormant for a period following the work of Leont'ev (1978; 1981) and Luria (1968; 1976).

analyzing accidents in Iowa privileged a largely alphabetic conception of genre. In particular, Spinuzzi pointed out *digital genres* (horizontal menus, vertical menus, dialog boxes, on screen reports, other accident locations and analysis software) and *analog genres* (printed reports, handwritten notes, copies of node maps, node maps, writing implements, paperweights, surfaces, other maps, police reports, and PC-ALAS manuals and training materials), and to a lesser extent *embodied genres* (oral readings of nodes) (p. 121). While the genres Spinuzzi identified demonstrated these public safety workers carried out work using multimodal literacy practices that leveraged a range of modalities and media (digital-visual, digitial-alphabetic, digital-spatial, and analog-alphabetic/ textual, analog-space, analog-visual, and embodied-oral), his study (in particular) and WAGR (more generally) could account for the interrelationships between genre, multimodality, and the practice of (literate) activity with a greater level of sophistication.[31]

Second, Spinuzzi's tools are useful for accounting for the interrelationships that firefighters in this study forged as genres and media were adopted, interrelated, discarded, and modified as literacies within the larger practice of firefighting. Tracing genres within the practice of firefighting across macroscopic, mesoscopic, and microscopic levels of scope, then, affords a view of the ways that genres are utilized in situated ways by specific agents. Like Spinuzzi who followed genre theorists such as Russell (1997), Windsor, (2003), Sauer (2003) Johnson (1998), and Herdl (1996), I understand that "the user of the technology has, through *techné*, the knowledge to overcome the potentially inevitable consequences brought forth by domineering and determining forces" (Johnson,

[31] Indeed, Spinuzzi (2003) suggested that as genre ecology diagramming was a method that could be further refined because "[connections between genres] may take on significance" (p. 54).

p. 52). Certainly, genres are situated within practices of literacy that are subject to the "tendential forces" (Johnson Eilola, p. 23) of cultural-historical sedimentation. Indeed, genres become operationalized, as they come part of a Bordieuan habitus (see Barwarshi & Reiff, 2010, p. 79). But rendering this tacit knowledge visible might allow firefighters to restore agentive power to the genres by revising or reorienting the relationships between subject positions, tools, object(ives), rules, community, and division as they are deployed within the practice of firefighting.

The chapter is organized into three main sections. The first section draws predominantly from interview data. I open by offering an activity system diagram of firefighting at a macroscopic level, and then sketch the ways that participants' descriptions revealed how firefighting is co-constituted as a socio-cultural activity across the macroscopic level of activity, the mesoscopic level of action, and the microscopic level of operation. Interviews afforded deep insights into the ways that subjects understood and/or described the ways that genres were utilized to pursue specific aims, especially at the mesoscopic level of action, but it was more difficult to account for the ways that firefighting had been inherited as a practice at cultural-historical levels and/or operationalized a microscopic levels. Nevertheless, the accounts participants offered demonstrated that discursive action has a powerful impact on the everyday maintenance and reconstitution of this activity system.

In the second section, I analyze data points corresponding to three minutes of observational activity discussed earlier in Chapter Three. Accounting for the multimodal relationships that constellated agents, artifacts, genres, and practices, I used data driven documents (D3), an open source coding language, to construct data visualizations of the

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}
```


Figure 5.1: Example of .json code used to organize data for D3 visualizations.

genre ecologies and genre assemblages related to this subset of data. The observational data set offered insight into the ways that operationalized genres circulated within practices, and also revealed that firefighters used different genre assemblages to realize different aims based on their functional and hierarchical positionality within the work activities undertaken.

In the final section, I pull these datasets together to construct a view of activity that complicates the view offered by the observational data or the interview data alone. That is, I examine the ways in which one contradiction within the system connects to a destabilization of action that can result in firefighters becoming lost and/or separated. Specifically, the data corresponding to this concluding example derives from observational data surrounding a secondary search described earlier in Chapter Three, two firefighters' descriptions of a similar search, and the vignette that opened this chapter.

Across time, space, operational divisions, and hierarchies: Firefighting at the macroscopic level of activity

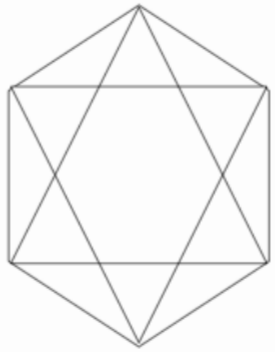
When viewed from a national macroscopic level, fire departments are one government sector actor among a wider range of actors that include civilian, corporate, government, and non-government stakeholders that share a common interest in how the U.S. might best respond to natural disasters and anthropogenic emergencies (Figure 5.2: A macroscopic view of firefighting in the U.S.). Like these other stakeholders, fire departments contribute to the collective aims of preparing for, responding to, and recovering from emergencies that threaten life safety, critical infrastructures, property, and the environment. However, as relatively local actors, fire departments such as those within the AFD, are subject to and influenced by regulatory decisions made by other actors within this activity system. For instance, federal, state, and local legislatures pass laws that regulate emergency response and fund executive branch agencies vested with providing oversight, enforcement, policy making, data collection, or education and training (e.g., Bureau of Alcohol, Tobacco, and Firearms; Department of Homeland Security; U.S. Fire Administration; National Institute for Occupational Safety and Health). The National Incident Management System (NIMS) and the Incident Command System (ICS) are powerful heuristics that DHS constructed, for example. These heuristics are used nationally by first responders and emergency managers to effectively coordinate incident response, and have a powerful shaping force on the ways that public safety and emergency management is realized within America. Whether at small scale or large scale incidents NIMS/ICS outlines procedures for managing a response because it clarifies jurisdictional responsibility, provides a structure for coordinating team labor, and offers

Figure 5.2
A macroscopic level view of the activity of firefighting in the U.S.

Actors-Subjects
- Citizens
- Government sector (e.g., Senate, House of Representatives, Supreme Court, Federal Emergency Management Agency, Department of Homeland Security, U.S. Fire Administration, Occupational Safety and Health Administration, municipal fire departments)
- Private sector (e.g., Insurance Service Office (ISO))
- Non-governmental organizations (NGOs) (e.g., National Fire Protection Association safety and standards agencies, American Red Cross, International Fire Service Training Association, International Association of Fire Fighters

Rules/Domain Knowledge
- NIMS/ICS
- NFPA codes and standards
- Chain of command, unity of command, span of control
- Fire behavior
- Experience
- Tacit knowledge
- Literacies including rhetorical knowledge such as familiarity with genres, audiences, and aims of tasks.

Tools and Artifacts
- Mediating documents (e.g., National Response Framework, National Incident Management System (NIMS)/Incident Command System, (ICS) NFPA codes and standards)
- Apparatus, equipment, & instrumentation (e.g, apparatus, digital, mechanical, electrical, analog, hydraulic, and simple machines)
- Infrastructures (e.g., transportation, water, energy, and telecommunications networks)
- Bodies (e.g., voices, hands, eyes, ears)



Community and Stakeholders
- Regional response area (e.g., fire scene, geographical local, fire district)
- Taxpayers, residents, government officials, commerce and businesses, insurance emergency service personnel, private-sector industry associated with fire service.

Object
Respond to natural, environmental, and anthropogenic disasters and emergencies that impact public safety, critical infrastructures, and property (e.g., floods, fires, wind, energy, chemical, and hazardous materials, mechanical, transportation emergencies).

Objective(s)
Successfully prepare for, implement mitigation efforts to, and recover from, emergencies events that threaten life, communities, property, and the natural environment. The life safety objective is represented by the Maltese Cross, an international symbol for the fire service.

Division of Labor
National Incident Management System
- Unified/Incident command
- Public information officer, liaison officer, & safety officer
- Operations section, planning section, logistics section, finance/administration section

Fire Departments
- Engine companies (primary tasks include water supply & fire suppression)
- Truck companies (primary tasks ladder operations, search and rescue, forcible entry, ventilation)
- Special hazards, squads, and or technical rescue companies (primary tasks include high angle rescue, rope rescue, trench rescue, swift water rescue, ice rescue, and vehicle/heavy rescue, and/or Haz-Mat response)
- Emergency medical services (primary tasks include medical duties, monitoring, rehab, patient care)
- Dispatch (primary tasks involve notifications, communications, incident recording)
- Command sector (primary tasks include development and implementation of policies, plans, and goals)
- Fire marshal and investigators office (primary tasks include fire prevention, fire scene investigation, and enforcement of fire and life safety code)
- Training division (primary tasks include education, skills development, unit readiness, and group evaluations and assessment)

processes to follow to implement an organized emergency response.

Beyond government agencies, private sector organizations and non-government organizations also have a significant influence on fire departments. Whereas the Insurance Service Office (ISO) evaluates fire districts/departments and assigns a grade that impacts tax rates within the response area, the International Fire Service Training Association (IFSTA) publishes and disseminates educational materials that influence the ways that firefighters and emergency service workers are trained. Moreover, the National Fire Protection Association (NFPA) creates national standards that impact how buildings are constructed (*NFPA 101: Life Safety Code*), how fire apparatus is manufactured (*NFPA 1901: Standard for Automotive Fire Apparatus*), and how fires are investigated (*NFPA 921: Guide for Fire and Explosion Investigations*).

From a rhetorical perspective, then, the activity of firefighting (at a macroscopic level) is realized by range of civilian, private, nongovernment, and government actors who contribute to the construction of this system in a variety of distinct ways: taxpayers fund governments and elect officials; elected officials pass legislation that funds fire departments and executive agencies like DHS; DHS implements NIMS/ICS; fire departments follow NIMS/ICS; fire departments purchase equipment from manufacturers; members of the NFPA author standards that about how manufacturers should make equipment to protect rescuers; manufacturers build equipment based on NFPA specifications. From a macroscopic perspective the distributed activity appears to be predominantly coordinated by, and carried out through, discursive, print-based, written documentation like *NFPA 1901: Standard on Automotive Fire Apparatus*, the U.S. Constitution, ISO's *The Fire Suppression Rating Schedule*, IFSTA's *Essentials of*

Firefighting and Fire Department Operations, and DHS's *National Incident Management System*. This appears to be due to the fact that these documents are visible material artifacts that attempt to prescribe, systematize, and regularize the ways that material resources (e.g., fire trucks, computers, steel), infrastructures (e.g., transportation, telecommunication, and water systems), and humans (e.g., firefighters, utilities workers, and citizens) might be coordinated in order to organize a collective response to the socio-economic aims of effectively preparing for, responding to, and recovering from emergencies and disasters that threaten human life, communities, property, and the natural world in which humans live.

Still, while documents like NIMS/ICS might prescribe how labor should be divided or how decision making processes should be enacted during actual emergencies, they also tend to gloss over the different ways that labor is divided and decision making processes are executed at a local level. Within NIMS, for instance, fire departments fit into the system as operational actors, and, in equating one fire department with another as operationally equivalent, this system glosses over the differences between how divisions of labor within distinct departments have grown organically from the cultural and historical situatedness of each department as unique socio-technical entities. Put more simply, because firefighting took shape as a distinct form of labor within specific communities, each fire department developed rules, practices, ways of communicating, and accepted distributions of labor which suited that locality. As new tools were introduced to these systems and as different departments learned the ways that other departments carried out similar work, local rules, practices, ways of communicating, and distributions of labor evolved.

For example, consider the ways that decisions regarding the distribution of labor —decisions that are largely taken for granted as standardized and regularized aspects of the U.S. fire service—are carried out on the fireground within the U.S. Today, a common division of labor is that engine companies establish a water supply and perform fire suppression, while truck companies perform search, rescue, and ventilation, but at one time these decisions were not standardized. Before engine and ladder companies existed in the Dutch colony that later became New York City, all male citizens had to serve on a fire watch and were assigned tasks in ad hoc fashion. (FDNY, para. 1). Over time, standardized divisions of labor were streamlined by dividing firefighters into specialized operational work groups called companies. In 1731, the city created a fire brigade and equipped it with two pumpers forming the first two engine companies, and the department which would later become FDNY received its first ladder company in 1772 when Hook and Ladder No. 1 was founded (FDNY, para. 4). It wasn't until 1915 that the Fire Department of the City of New York (FDNY) formed Rescue 1, the first rescue company in the nation that outfitted with specialized tools for doing work that engine and ladder companies struggled to perform with existing tools and techniques (PBS, para. 9).

Notwithstanding all the change that the fireservice has undergone, it continues to resemble Augustus' *Vigiles*, a Roman firefighting force organized millennia ago (Hirst, 1884, p. 3-5). Revered by the Roman people, these firefighters were affectionately labeled the *Sparteoli* after the Esparto plant from which a special thread was constructed. This thread was used to make blankets that the Sparteoli would soak with water and lay over the top of roofs to smother the fire, buckets that they used to carry water to the fire, as well as protective hats, shirts, and shoes that these Roman firefighters wore to protect

themselves from the heat. When Sparteoli were summoned to mitigate the disastrous effects of fire, a Sparteoli would fulfill one of four functional divisions of labor: (1) the *Sebaciarius* or "man who carried the light to show the way"; (2) the *Emitularius* or "comrade who carried the appointed water bucket"; (3) the *Siponarii* who likely manned pumps that filled the buckets; and (4) the *Aquarii* who threw the water onto the fire (Hirst, 4-9). Certainly, much within the fireservice has changed: Kevlar and Nomex threads have replaced the Esparto; firefighters no longer throw wet blankets onto structures; the Sebaciarius have been replaced by regional dispatch centers made use of radio and digital technologies tat alert firefighters to alarms; and, women now serve beside men. Yet much continues to remain the same: water has prevailed as an effective extinguishing agent; pumps still facilitate the supply of water; protective garments, even now, are made from special fabrics; and, the primary objective of firefighting, as a human activity, continues to be to save lives, preserve critical infrastructure, and mitigate the loss of property.

Consequently, while the macroscopic view of activity provides an insightful look into firefighting as a larger socio-technical entity, as well as how it has evolved from unique cultural and historical locations, it doesn't illuminate the ways that this system is maintained by rhetorical work, it doesn't account for the ways that local actors use and resist these powerful documents in practice, and it doesn't account for the ways that oral, visual, aural, tactile, spatial, kinesthetic, and literacies contribute to the daily construction and reconstruction of this system. In order to reveal the ways that this system is actively maintained, we have to take up a mesoscopic view of the way agents realize the larger macroscopic aims through action.

Across time, space, operational divisions, and hierarchies: Firefighting at the mesoscopic level of action

To examine the ways that the system is maintained at the level of action, consider Chief Russo's explanation of how he leveraged a NFPA standard to support changes to a dispatch center that Baytown Fire Department shared with the Baytown Police Department:

> [I showed him the standard but] it's hard to get [the police chief] to understand... when [he doesn't have] the exposure [what we do as a fire department]—like...he told me I was trying to build an empire. No. I'm trying to [have a dispatch center that runs] the right way. It's all about workspace, and the availability [of dispatchers]. If I've got two dispatchers, and they are sitting shoulder to shoulder... [they can't focus]... cause it's two different things going on. And, when it gets really loud and complicated, and the phones are ringing and everything else, *then you can't concentrate on anything*.... Not everybody can get that concept. Well, they just need to focus more. That's what I get told. They need to focus more. Whatever. (p. 1)

Here Chief Russo illustrated the challenges associated with enacting standards in real local settings. Historically, dispatch had been co-owned by the police and fire department, and Chief Russo was happy with that arrangement, but he also wanted to change the way the dispatch center was laid out so that it would support the work that dispatchers do. So he brought in the NFPA standard to show the chief of police that the fire service has parameters on how these types of facilities are built. This account demonstrates that while the NFPA regularly passes standards, it is up for locally situated stakeholders to

make use of, or disregard, the parameters outlined in these types of governing documents. For Chief Russo the NFPA standard isn't a rule, but rather a tool that he used to support a claim he had advanced within an on-going argument that involved discussions, phone calls, and meetings with the chief of police, union representatives, and the mayor of Baytown about whether, and if so how, the dispatch center should be restructured. Indeed, Chief Russo understood that Baytown Fire Department could be held to the NFPA standard in a court of law, but realized that he needed to make a persuasive case for enacting these changes with other stakeholders that co-owned a specific resource (a dispatch center), but for uncertain reasons were resistant to enacting such changes.

During a subsequent meeting with the police chief and the mayor of the Baytown, Chief Russo "brought in [a representative from] Homeland Security" to further back his claims because it "was somebody who had no dog in the fight, who had nothing to gain from it, had no dollar value to gain from it" (p. 1). Again, by bringing in a speaker that strategically strengthened his own claims, Chief Russo demonstrated that he understood the need to change the way the dispatch center operated was a layered, multifaceted argument that had as much to do with the current operations of the dispatch center as it did about his ethos and motivations for desiring this change.

Moreover, what I want to draw attention to is that by transitioning a mesoscopic level of action we gain a finer grained view of how the system evolves as situated within time and space. Specifically, in this case, we see how specific actors (Chief Russo) make use of specific tools (organizational meetings; phone calls; NFPA standards; testimony from experts) to pursue local aims (restructure the way that a dispatch center is configured) that support or respond to the larger macroscopic aims of preparing for,

responding to, and recovering from emergencies (differently). Furthermore, taking up a view of action demonstrates the importance that domain knowledge has for enacting changes to a system that is constructed in distributed fashion. That is, Chief Russo understands that firefighters in Baytown will be served by a dispatch center in one way or another, but makes use of his knowledge of the way that activity system is structured at a macroscopic level, including referencing artifacts (NFPA standards) and co-stakeholders (representative from DHS) to demonstrate that his claim is sound (or, more sound than it would be if he advanced a claim about change separately).

Further, Chief Russo's account revealed that he understood written documents like NFPA standards as flexible to the extent that they could be interpreted differently by those who use them: "[NFPA] is trying to do things to make [firefighting] as safe as they possibly can, but it's like I can write an order and I can say this is what you're going to do but if I don't change a mind set and I don't change the way people think before I put that in place it's going to take no effect. It's not going to matter" (p. 3). To be sure, Chief Russo grasps that the end users of documents have the agency to either follow or disregard governing documents like NFPA standards, polices and orders. Consequently, he suggested that in order to realize his own aims as a leader of the Baytown Fire Department he must put a great deal of work persuading the firefighters who work for him that his ideas are valid in order to garner buy in about the validity of his command decisions: He explained, "you write an order," but if that order is unpersuasive an audience will follow that mandate in a less compelling way: "I can write it, just like NFPA can mandate it and write it, but if you don't get it at the grass roots, if you don't get them to understand it, it's all for nothing" (p. 4).

What I find most fascinating about Chief Russo's description, however, is the way that he described using time and space away from the fireground in order to improve the ways that work was performed upon it. For instance, he discussed how he had dealt with a incident commander who had called for mutual aid from neighboring fire departments, but who had not effectively utilized the existing resources on the scene prior to making that decision:

> I have this thing where I always want them to call me right away to let me know that they got a working fire cause sometimes our paging system isn't really appropriate. So ... I'm hearing all this mutual aid coming in and I'm like, I was a little pissed...[because] when I got there and I'm looking at it...I'm like, there is no real water supply set up. I've got three trucks parked all acting independently from each other, and I'm like what the hell are you guys doing? [...] [A]ll three of 'em are working independently from each other. That's not the teamwork, that's not coordination of the assets that are there. So when I sat down and I talked to the incident commander about it, I told him my displeasure.... I thought it looked very disjointed and there was no coordination of effort there. And, it was like this. He says to me, well I've always been taught—cause [he] started going back to what our SOPs were. I said, have you ever read our SOPs: it said that first truck is fire attack and second truck establishes the water supply and that's what they should be doing. And, then, we went through each position where everybody was. And, he says, well that's not what I've been taught. I said, well what have you been taught? He said, I was always taught that you always bring the second engine up to the fire because you might tools off of it. I said, why do you need the

> engine then? Just put it in a pick up and bring the tools up, because you've effectively taken the engine right out of the mix where it should be pumping you water. And,he said well that's what I've always been taught, so we had to go back into a re-learning process.

Again, Chief Russo expressed that he was unhappy with the way the incident had been run, but he also understood that simply telling the member of his command staff that he was wrong was an ineffective way to convince him to change the way he managed a scene in the future. What I want to draw attention to is that the incident commander attempted to draw on the SOPs as a way of supporting his claim about how to enact work, just as Chief Russo had done with the police chief, but in this case, Chief Russo used his knowledge of the SOPs to advance a counter-argument. Because the incident commander brought up the SOPs, it gave Chief Russo an opportunity to explain what the SOPs *actually* state. However, Chief Russo also demonstrated that he realized that the policies must be interpreted and enacted by humans, so he asked the incident commander "what have you been taught?"

This was agentive rhetorical move because it opened up a space for the incident commander to co-create knowledge about the SOP. That is, in allowing the incident commander to explain why he had that choice he had made—a choice that the chief was unhappy with—the chief was able to better understand how the IC commander had understood the SOPs as implemented in action, and it also gave the IC an opportunity to save face because he was able to explain that apparatus had been historically utilized in Baytown in ways that differed from how the written SOPs suggested they should be used: "he was always taught that you always bring the second engine up to the fire." Having

reached a point of stasis within the disagreement where they both understood each others rationale, Chief Russo explained that he began "a re-learning process" with the senior officer. Again, from multimodal perspective this account is fascinating because it demonstrates the relationship between print-based literacies and oral-based literacies in coordinating work activities at a command level. For Chief Russo, there is a great deal of value in print-documents because he can point to them to identify areas of stability within a system, but then he simultaneously uses the flexibility associated with oral argumentation to persuade other stake holders that his own readings of NFPA policies and/or SOPs are accurate and helpful to the larger aims of those with whom he is working. And, as *the* Chief officer of a department he could compel those around him to act by ordering them to do so, but he realizes that it is amenable to work to garner buy in: "again, go back to the standard" I can write the standard all day long...but if I don't educate them at that then what have I accomplished? I've just written something on a piece of paper that isn't worth crap" (p. 4).

Captain Lynch explained a similar process whereby he would spend time talking with the firefighters who worked with him to train them to make decisions he wanted them to make, but would do so independently:

> I think communication starts long before the fire starts. I'm lookin at it, [as they're] working for me, as [their] officer. I communicate to [them] long before the incident occurs what I expect. ...[I say] when we pull up at a fire I want you to do this.... [I]f we do this, this is your standard operating procedures that you don't need to ask me, which communicates to me that [they are] getting [their] accomplishment[s] done.

While the SOP exists as a material artifact, Cpt. Lynch uses an oral description of the artifact to inform the workers of his expectations. That is, Cpt. Lynch doesn't ask his firefighters to read the SOP independently, but suggested that he provided these workers with his own local interpretation of the SOP. Specifically, Cpt. Lynch outlined that he expected firefighters working with him to internalize these expectations and then independently make the types of decisions he expected them to be able to make at incidents. Here Captain Lynch works actively at the mesoscopic level to prepare firefighters to become so familiar with their work actions that they carry out these tasks as microscopic operations that they perform without even realizing they are doing so. "I don't want to have to tell them. I want it to be done.... I want to know. I want to know. I don't want to have to go through, ok, I want you to pull this line right here" (p.).Within activity theory the internalization of such knowledge is conceptually regarded as operationalization. Kaptelinin and Nardi (2006) explained that operationalization occurs, "over the course of learning and frequent execution, a conscious actions may transform into a routine operation" (p. 63). Private Prior, who worked with Cpt. Lynch, explained that having an internalized familiarity with each others' responsibilities and decision making processes was an important component of the working relationship that he and Captain Lynch had constructed by working together in fires over the course of five years:

> And, the longer you work with somebody the more you're used to what's going on. What they're going to do next. It's almost like you don't need to talk so much. You know that he's going to be doing that while you'll be doing this. [...] I knew where he was. I knew his paths, where he's going to be going. I understand how he progresses through buildings.... We [don't] need to so much say, right I'm on

the second floor. I know he's on the second floor. It's just, it's where you're going to be. Well, where's the fire? It's a basement fire. Where's it going to be next. It's a balloon frame structure it's in the attic, and we're finding the attic.

What I want to draw attention to is not just that Firefighter Prior described having an embodied sense of knowing how Captain Lynch moves through space, but that this very description reveals an embodied understanding of the ways that fires travel and progress within specific types of buildings.

In this case, Ff. Prior explained that in a structure built with balloon-frame construction, he'll predict that Captain Lynch will go to the attic, because the fire's in the basement. By explaining where's the fire going to be next, he reveals a cognitive process through which he predicts and anticipates the progress and spread of the fire, and predicts where Cpt. Lynch will move to next because he anticipates that Cpt. Lynch will tactically prioritize getting ahead of the fire to prevent it from spreading further. That is to say that Ff. Prior not has an internalized ability to read architecture, read fire, and predict future fire behavior, including how it will spread within structures, but he also draws off of experiential knowledge of the ways firefighters work in relation to these variables in order to construct knowledge of where firefighters are likely located within specific structures because of the location of fire. Put simply, Ff. Prior's description demonstrates that he leverages a wide array of non-traditional reading and writing processes, and draws from generic knowledge of architecture, fire behavior, fireground tactics in order to work with Captain Lynch in such as way that they "don't need to talk so much."

Note that absent from Cpt. Lynch and Ff. Prior's descriptions are written policies, NFPA standards, and texts. Certainly, Cpt. Lynch's description of the SOP seems to

assume that he's read that procedure, but it could also be that he is orally passing on his interpretation of a reading that he learned orally, as well. Regardless, the coordinative work of preparing for a fireground response is done off scene at the station teaching and explaining expectations, responsibilities, and tasks, but their descriptions also reveal that experiential knowledge aggregated on actual firegrounds is also an important source of knowledge that enables these firefighters to perform complex cognitive work like reading smoke, architecture, and drawing inferences about how fires are likely to spread. Ff. Prior doesn't explain that he pulls out a manual to decipher how to read a building or a guide on how to assess what heavy, voluminous, chunky black smoke that is forcibly pushing itself out from a structure with great velocity means in comparison to heavy, voluminous, chunky black smoke that is gently puffing in and out of the eves of a structure. Instead, *he just knows* what these things mean. Ff. Prior didn't describe how he had been taught to read smoke, but it is clear that Ff. Prior understands that identifying "four distinct attributes: volume, velocity, density, and color" of smoke is important to reading (Dodson, 2005, para. 7).

Each of these examples highlights how the work of firefighting is carried out at very across macro, meso, and microscopic levels by firefighters of differing ranks, who access different sets of modalities when in distinct spatio-temporal proximities to actual emergency scenes. For instance, as the senior-most officer within the Baytown Fire Department, Chief Russo is vested with the responsibility of writing institutional policy, whereas Captain Lynch and Ff. Prior are not. Still, both leaders understood that written policies must be interpreted and enacted in local settings, and including an understanding that the types of interpretations that are transferred orally seem to stand in for the actual

written policies themselves. Reflecting back on the views of work found in Chapter Three and Chapter Four, it is certain that print, oral, and digital literacy practices play a significant role in helping firefighters to prepare and plan work activities prior to emergencies, and to evaluate and revise their responses thereafter. However, as we move closer to the actual fire scenes where responses are realized in real-time, practices for constructing and communicating knowledge make greater use of literacies that leverage analog and digital radio technology, as well as embodied literacies practices that lean on touch, movement, speech, and vision. Put differently, firefighters involved in interior firefighting make greater use of non-alphabetic literacy practices, whereas those positioned at a greater spatial and temporal distance from emergency scenes appear to draw from alphabetic literacies more readily whether the practices associated with those literacies involved accessing, constructing, managing, and understanding emergency scenes from this distance, constructing NFPA standards to regulate or alter the ways that current practices are enacted, and/or by requiring incident commanders to call commanding officer because of an inadequate paging system.

Moreover, as we privileged different levels of scope different modalities became more and less visible. For instance, at a mesoscopic level of action, it is clear to see the ways that Chief Russo used orality as a way of garnering support for, and getting firefighters to actually practice (and not just give lip service to) the procedures he had outlined within written polices. But, if viewed at a macroscopic level of activity, it is difficult to account for individual actors because there is a much broader view of actors who contribute to the construction of these activity system at that level of scope. In the

next section, I turn toward an analysis that draws from observational data to understand the ways that activity is enacted at an microscopic level.

Across time, space, operational divisions, and hierarchies: Firefighting at the microscopic level of operation

In the previous section, Pr. Prior and Cpt. Lynch outlined that operationalization was an important component of their work activity. However, what was notable about that description was that a great deal of the knowledge required to perform these tasks was assumed or specifically absent from their descriptions. As activity theory would posit, this is because actions that have become operationalized are so routine as to be imperceptible by those carrying them out. Recall the description of the secondary search that firefighters performed in Chapter Three:

> Ff. Ennis taps the floor rapidly with the axe to serve as an aural reference point for Ff. Larimore and Ff. Linn who fan out and search ahead of the control-person in the smaller sized room (See Figure 15: Ff. Ennis uses his axe to provide an aural reference point). By using tools in this way and distributing the crew across the space, the crew is able to move rapidly through the quickly complete the search. As with the earlier searches, the wall-person, Ff. Linn, continues to maintain contact with the outside wall with his hand. Meanwhile, Ff. Larimore keeps contact with Ff. Linn by holding his boot. Ff. Ennis continues to bang away at the floor, providing the team members a secondary point to orient to as the team navigates. If the crew needs to exit quickly, they can simply turn and follow the outside wall back to the tapping of Ff. Ennis' axe. Or, if the two members

discover another room, they can can yell back to Ff. Ennis, directing him to chase the left hand wall until he meets up with them.

"Clear." "Clear." "I'm over here." "Clear." The crew decides to continue forward. Ff. Linn yells back to Ff. Ennis: "Get up here." Ff. Ennis chases the wall, closing up the gap. Ff. Linn passes through the threshold continuing the left hand search down the side-C wall. He locates a window and opens it. Ff. Larimore and Ff. Ennis slide into the room behind him. When Ff. Linn sees that Ff. Larimore and Ff. Ennis are safely in the small room, he points to the two to move ahead to the next room that is directly in front of him Members of seasoned crews often piggyback off of and around one another like this, organically trading the positions and roles in order to move efficiently through confined spaces such as hallways. In this case, Ff. Linn was the first to enter this extremely small room, and now Ff. Linn is now blocked in by Ff. Ennis and Ff. Larimore.

As I described, firefighters used touch, search patterns, oral communication, and the aural sound of the axe tapping in order to distribute and coordinate the work activity associated with performing a secondary search. Whereas one firefighter remained at the entryway to the rooms, other members of the crew followed an outside wall on a left-hand search, and used touch to stay in contact with one another and navigate the space. What is most notable about this example is the degree to which firefighters had such an ingrained knowledge of each others' activities, realizing and reacting to the different roles that they each had a role to perform. Noticeably absent from this work is discussion related to planning, organizing, or coordinating this work. Instead, when the crew approached the room, momentarily pausing at the threshold of the doorway, one firefighter simply

stopped, and allowed the other two firefighters to pass ahead and spread out across the room. Again, the firefighters communicated, but many decisions weren't communicated orally. They were simply understood at a functional level, or as a matter of the positionality that each member of the team occupied with respect to one another. Their activities had been so orchestrated as to appear seamless. This owes to the fact that—while there is a great deal of heuristic and situational flexibility built into systems that firefighters use to carry out their work—many work practices (e.g., hose-line advancement, search and rescue, and/or forcible entry) that firefighters engage in are fairly regularized and consequently carried out in ways that correspond to accepted methods.

What the firefighters didn't have to do was decide what a secondary search was or how to perform that activity. Instead, the firefighters understood that a secondary search is a regularized and standardized way of achieving a specific objective (ensuring that there are no victims in a structure). However, these firefighters had clearly engaged in this practice numerous times, because the search was carried out in such a proficient, efficient way. In other words, these firefighters had operationalized the knowledge about how this process is enacted in practice: each member of the crew knew what it meant to perform a left hand search; each member of the team shared a common vernacular for talking about space that borrows from ICS; each member of the team knew what needed to be said to coordinate the search and what other members already knew; and, each member of the team understood and assumed one of the different functional divisions of labor that needed to be carried out. Taking up the later, for instance, one member took a position as a firefighter holding the wall. This firefighter used touch to maintain physical contact with

a waypoint (the wall) in order to provide an anchor point that the rest of the team radiated away from. This firefighter assumed responsibility for providing the waypoints for the team which enabled the second firefighter to move up and perform a tactile-kinesthetic sweep of the middle of the room that created knowledge that informed the ways that crew acted. If the firefighters located a victim, the team would stop and begin to extricate that victim from the hazard. However, if no victim is found, they continue forward.

Another notable aspect of the search was the way the firefighter positioned at the doorway continuously sounded his axe on the floor in order to provide an aural reference point that helped the team navigate. By doing so, the firefighter provided the crew members moving dynamically through space with to a secondary reference point to orient themselves within space. Indeed, many things are communicated between team members using a range of modes, but much isn't stated. The crew didn't discuss who was going to do what work. Rather, each organically filed into assume a role that wasn't yet filled, but which needed to be performed in order to execute the search. The crew also didn't need to discuss how to navigate the space, because at some point they had decided that they were going to perform a left hand search. However, because the firefighters had operationalized the activity of searching, the firefighters ended up making an arbitrary decision to perform a left hand search that evening. In the after incident analysis of the training, the Dc. Kavanagh and Lt. Lamb mentioned that instead of simply performing this searches in rote fashion that the crew needed to stop and listen for contextual cues that could inform their decision to perform a left or right hand search. That is, by calling out in rooms and on floors, and listening to see if they heard a response they might give victims a chance by directly navigating to their locations within the structure.

Examining firefighting from a microscopic level of operation is difficult because a great deal of the work that is performed at this level is not only unseen and but also not consciously described by participants continues to escape view. Still this example highlighted the ways that embodied modalities such as aurality, gesture, touch, movement, and cognitive heuristics for navigating space overlay, correspond, and compete with the oral and print based literacies surrounding firegrounds. Considering the ways that firefighting is co-constituted as an activity across different levels of scope which constellated a range of agents, tools, and object/ives, it is clear that a great array of genres are mobilized in distinct locations by distinct agents to realize distinct aims. In order to better understand the interrelationships between those agents, multimodal genres, and the contexts I mapped a number of the genre assemblages that made up the larger genre ecology that firefighters utilized. In the next section, I explore those assemblages, before concluding with an analysis of the ways that a contradiction related to the incommensurability of competing aims and genres mobilized within the system could pose one type of communicative hazard for firefighters.

Genre Ecologies and genres assemblages

"Genres," Spinuzzi (2004) posited, "are used in assemblages or complexes; few if any technological activities use just one, and most use great clouds of them" (p. 110). Indeed, genre theorists have long sought to understand the ways in which genres interrelate and impact one another. Indeed, as he explained, RGS had framed genre assemblages in four ways that were theoretically distinct: genre sets (Devitt, 1991); genre systems[32]

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[32] Spinuzzi (2004) argued that genre systems have been theorized in two theoretically distinct ways. I have grouped scholars associated with the two different approaches into two different parenthetical citations to respect this distinction (p. 113).

(Bazerman, 1994; Yates & Orlikowski, 2002) (Bazerman, 2003; Russell & Yanez, 2003; Russell, 1997); genre repertoires (Orlikowski & Yates, 1994); and genre ecologies (Spinuzzi, 2003; Spinuzzi & Zachry, 2000). Accounting for the differences, Spinuzzi (2004) added his own emerging concept of the genre ecology to the fray, and suggested that it conceptually accounted for the overlapping quality of genres, the role that unofficial and official genres performed within ecologies, as his approach understood genres as inherently mediational in nature (p. 7). Building on Spinuzzi's approach, then, I trace out a view of the genre ecology that corresponded to a primary search outlined in Chapter Three. Specifically, I traced three minutes of activity accounting for the relationships between the agents, artifacts, and all of the visual, aural, oral, radio, textual, kinesthetic, tactile, cognitive, and/or spatio-temporal genres that were perceptible within that period. In doing so, accounted for over 80 distinct data points (Table 5.1: Data points from a secondary search). Accounting for the soundscape alone was complicated, as there were 21 radio messages, four instances where there was feedback or squelch from the radios being in close proximity to one another, eight microphone key alert chimes (an aural alarm that indicates that a lapel mic is transmitting), five moments where PASS devices either chirped, chimed, or began to alarm, at least four instances of tools sweeping across the concrete floor that lasted between four and 20 seconds, the sound of compressed air filling SCBA masks as firefighters inhaled, pops and crackles from the sound of the fire burning, ambient noise from the diesel engine from the apparatus vibrating, six distinct conversations wherein firefighters talked about the work they were performing at length, one brief statement, and an extended report wherein members of team two relayed an urgent message to inform the IC that they had located a fire.

Table 5.1: Data points from a secondary search

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
Diesel engine	00:10-03:10	Special Hazards 1	Pump/Apparatus	Various: supply water, energy, scene lighting	Aural
Smoke	00:10-03:10	Fire-combustibles	N/A	N/A	Visual
Pops, crackles	00:10-03:10	Fire-combustibles	N/A	N/A	Aural
Helmet shields	00:10-03:10	Firefighters	PPE	Identification (unit, individual, function/rank)	Visual, alpha-numeric, color
Tail-bibs	00:10-03:10	Firefighters	PPE	Identification (individual, function)	Visual, alpha-numeric, color
Turn out gear	00:10-03:10	Firefighters	PPE	Various: safety, identification (department, individual, function/rank)	Visual, alpha-numeric, color
Incident command system	00:10-03:10	DHS-FEMA	Organizational framework	Facilitate coordination and cohesion of emergency response, communication, and management.	Cognitive, oral
Command post	00:10-03:10	Lt. Lamb/IC	Radio, accountability tags, accountability board, watch, line of sight	Various: coordinate, facilitate, and oversee on-scene activities safely	Visual, alpha-numeric, cognitive, oral, aural
Station wear	00:10-03:10	Firefighters	Clothes	Warmth; Identification; Identity	Visual, alpha-numeric, symbolic, color
Tags	00:10-03:10	ICS-AFD	Accountability system	Tracking: firefighter safety	Alpha-numeric
NFPA 1001; 1002; 1021; 1041; 1402; 1403; 1407; 1500; 1521; 1851; 1852; etc.	00:10-03:10	NFPA	National standards	Various: legal, safety, manufacturing, standardization of best practices	Alpha-numeric
SOGs/SOPs	00:10-03:10	Alliance Fire District	Standardized guidelines and procedures	Various: training, safety, dissemination of information regarding desired/ascribed practices	Alpha-numeric
Paint, gold leaf-lettering	00:10-03:10	Alliance Fire District	Special Hazards 1, Engine 14	Various: tradition, identification	Alpha-numeric, color, font

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
Warning labels	00:10-03:10	SCBA, PPE, helmet, apparatus	Label	Various: legal, safety, limitations	Alpha-numeric
Group discussion	00:10-00:12	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	Body	Unknown: plan/coordinate work	Oral, visual, gestural, alpha-numeric, posture
Radio (mic-key alert) 1	00:11-00:12	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio-message 1		Ff.Ennis	Portable UHF (low-ban) radio	Inform IC: work status	Oral, aural, alpha-numeric
Group discussion	00:15-00:28	Team 1: Lt. Brodrick, Pff. Kehoe, Pff. McGarrah	Body	Unknown: plan/coordinate work	Oral, Gesture
Radio-message 2	00:16-00:17	Lt. Lamb/IC	Portable UHF (low-ban) radio	Acknowledge message	Oral, aural, alpha-numeric
Radio (mic-key alert) 2	00:18-00:19	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 3	00:19-00:24	Ff. Ennis	Portable UHF (low-ban) radio	Inform IC: task (search), who (unit/number of members), location (where)	Oral, aural, alpha-numeric
Radio message 4	00:25-00:29	Lt. Lamb/IC	Portable UHF (low-ban) radio	Confirm message by repeating	Oral, aural, alpha-numeric
Hand to outside wall	00:26-00:57	Ff. Ennis	Body	Navigation, location, construct mental map	Cognitive, tactile, kinesthetic
Hand to SCBA	00:26-3:10	Ff. Larimore	Body	Team cohesion	Tactile, kinesthetic
Hand to boot	00:26-3:10	Ff. Linn	Body	Team cohesion	Tactile. kinesthetic
Waving-dragging tools across floor	00:28-00:57	Ff. Ennis, Ff. Larimore, Ff. Linn	Body-tool	Various: construct mental map, check for safety of floor, search for victim(s)	Tactile, kinesthetic, aural
Talking	00:29-01:07	Ff. Ennis, Ff. Larimore, Ff. Linn	Body	Various: share knowledge of environment, object-spatial characteristics, change speed (e.g., slow down/speed up search), coordinate effort	Oral, alpha-numeric
Wander, check gear, watch activity	00:31-01:28	Pff. Kehoe, Pff. McGarrah	Body	Various: prepare, learn, safety check	Kinesthetic, tactile, visual
Observation (crouching)	00:34-01:23	Lt. Brodrick	Body	Observe team 2 conduct search	Visual, posture

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
SCBA-Breathing (inhale)	00:45-00:46	Member of Team 2	SCBA/Body	N/A	Aural, kinesthetic
Hand to mattress	00:57-01:07	Ff. Ennis	Body	Search for victim(s)	Tactile, kinesthetic
Hand to outside wall	01:07-03:10	Ff. Ennis	Body	Navigation, location, construct mental map	Cognitive, tactile, kinesthetic
Radio message 5	01:07-01:09	Lt. Lamb/IC	Portable UHF (low-ban) radio	Hail team 2	Oral, aural, alpha-numeric
Radio (mic-key alert) 3	01:10-: 01:11	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 6	01:11-01:14	Ff. Ennis	Portable UHF (low-ban) radio		Oral, aural, alpha-numeric
Radio feedback	01:11-01:14	N/A	Portable UHF (low-ban) radio	Unintended: interference	Aural
Reading smoke (change)	01:12-03:10	Fire-combustibles	N/A	N/A	Visual, spatial, kinesthetic
Hip shaking	01:12-01:14	Pff. McGarrah	Body	Prevent PASS activation (non-movement)	Kinesthetic
SCBA (low-level alarm, non-movement)	01:13-01:14	SCBA	PASS	Firefighter safety: locate firefighter if incapacitated	Aural, volume, intensity,
Radio message 7	01:14-01:20	Lt. Lamb/IC	Portable UHF (low-ban) radio	Convey critical info (view from outside: heavy smoke pushing/possible location of fire)	Oral, aural, alpha-numeric
Pointing	01:21-01:22	Ff. Larimore	Body	Direct other members' attention to fire visible in B/C corner	Kinesthetic, gestural
Group discussion	01:22-01:27	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	Body	Co-construct IC message; devise a response to IC	Oral, alpha-numeric, tone
Radio (mic-key alert) 4	01:28-01:29	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 8	01:28-01:34	Ff. Ennis	Portable UHF (low-ban) radio	Inform IC of fire location	Oral, aural, alpha-numeric
Radio feedback	01:28-01:34	N/A	Portable UHF (low-ban) radio	Unintended: interference	Aural
Statement	01:35-01:36	Ff. Larimore	Body	Motivate team to resume search	Oral

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
Places hand to mask	01:37-01:39	Pff. McGarrah	Body-tool	Ensure seal/fit of mask	Kinesthetic, tactile, breath
Radio message 9	01:38-01:41	Lt. Lamb/IC	Portable UHF (low-ban) radio	Hails team 1; gives order to prepare for fire attack	Oral, aural, alpha-numeric
Waving-dragging tools across floor	01:40-01:44	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	Body-tool	Various: construct mental map, check for safety of floor, search for victim(s)	Aural, kinesthetic, tactile
Radio (mic-key alert) 5	01:42-01:43	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 10	01:43-01:47	Ff. Ennis	Portable UHF (low-ban) radio	Repeats last message that was not acknowledged (inform IC of fire location)	Oral, aural, alpha-numeric
Radio feedback	01:43-01:47	N/A	Portable UHF (low-ban) radio	Unintended: interference	Aural
Gesture (thumbs up)	01:46-01:47	Lt. Brodrick	Body	Acknowledge receipt of IC command	Visual, gestural, kinesthetic
Radio message 11	01:49-01:50	Lt. Lamb/IC	Portable UHF (low-ban) radio	Copy message	Oral, aural, alpha-numeric
Waving-dragging tools across floor	01:49-02:10	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	Body-tool	Various: construct mental map, check for safety of floor, search for victim(s)	Aural, kinesthetic, tactile
Group discussion	01:58-02:06	Team 1: Lt. Brodrick, Pff. Kehoe, Pff. McGarrah	Body-tool	Lt. Brodrick positions Pff. Kehoe and Pff. McGarrah on the handline	Oral, gestural, kinesthetic, tactile
Hand to hoseline	02:03-03:10	Team 1: Lt. Brodrick, Pff. Kehoe, Pff. McGarrah	Body-tool		kinesthetic, tactile
Radio message 12	02:05-02:07	Lt. Lamb/IC	Portable UHF (low-ban) radio	Hail team 2	Oral, aural, alpha-numeric
Flashlight	02:07-03:10	Lt. Brodrick	Flashlight	Illuminate environment; identification	Color, luminosity, blinking
Radio (mic-key alert) 6	02:08-02:09	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 13	02:09-02:10	Ff. Ennis	Portable UHF (low-ban) radio	Acknowledge message	Oral, aural, alpha-numeric
Radio message 14	02:10-02:14	Lt. Lamb/IC	Portable UHF (low-ban) radio	Informs team 2 that team 1 will be entering	Oral, aural, alpha-numeric

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
Group discussion (PAR)	02:14-02:21	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore/IC	Body	Account for PAR (level of air, members of team present, members of team well)	Cognitive, oral, visual
Air management	02:19-02:22	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	N/A	Firefighter safety	Cognitive
SCBA gauges	02:19-02:22	SCBA	SCBA	Display level of compressed air remaining in cylinder	Visual
SCBA (low-battery chirp)	02:19-02:21	SCBA	PASS	Alert user that batteries are low	Aural
SCBA (reset series of chimes)	02:22-02:23	SCBA	PASS	Informs user that s/he has successfully reset PASS device	Aural
Radio message 15	02:25-02:27	Lt. Brodrick	Portable UHF (low-ban) radio	Hail IC	Oral, aural, alpha-numeric
Radio message 16	02:28-02:29	Lt. Lamb/IC	Portable UHF (low-ban) radio	Acknowledge message	Oral, aural, alpha-numeric
Radio message 17	02:29-02:37	Lt. Brodrick	Portable UHF (low-ban) radio	Inform IC: task (search), who (unit/number of members), location (where)	Oral, aural, alpha-numeric
Radio message 18	02:38-02:41	Lt. Lamb/IC	Portable UHF (low-ban) radio	Confirm message by repeating	Oral, aural, alpha-numeric
Radio (mic-key alert) 7	02:40-02:41	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio message 19	02:41-02:43	Ff. Ennis	Portable UHF (low-ban) radio	Hail IC	Oral, aural, alpha-numeric
SCBA (low-battery chirp)	02:42-02:44	SCBA	PASS	Alert user that batteries are low	Aural
SCBA (reset series of chimes)	02:44-02:46	SCBA	PASS	Informs user that s/he has successfully reset PASS device	Aural
Radio message 20	02:45-02:46	Lt. Lamb/IC	Portable UHF (low-ban) radio	Acknowledge message	Oral, aural, alpha-numeric
Radio (mic-key alert) 8	02:47-02:48	Ff. Ennis	Portable UHF (low-ban) radio	Alert speaker that microphone is open	Aural
Radio feedback	02:48-02:50	N/A	Portable UHF (low-ban) radio	Unintended: interference	Aural

Artifact/ Genre	Duration	Agent (Originator)	Tool (Intermediary)	Object(ive)	Modal Attributes
Radio message 21	02:48-02:50	Ff. Ennis	Portable UHF (low-ban) radio	Gives a PAR check for IC (level of air, members of team present, location of team, well being of team members)	Oral, aural, alpha-numeric
Waving-dragging tools across floor	02:50-03:10	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore	Body-tool	Various: construct mental map, check for safety of floor, search for victim(s)	Aural, kinesthetic, tactile
Crawling	02:51-02:54	Team 1: Lt. Brodrick, Pff. Kehoe, Pff. McGarrah	Body	Safety	Kinesthetic, spatial
Group discussion	02:56-03:01	Team 2: Ff. Ennis, Ff. Linn, Ff. Larimore; team 1: Lt. Brodrick, Pff. Kehoe, Pff. McGarrah	Body	Team members coordinate passing by each other in confined space	Oral, alpha-numeric, aural, visual, kinesthetic, tactile, gesture

I then analyzed the data points and took stock of distinct genre ecologies that were present within the data set. Thereafter, using open source code associated with the data driven documents (D3) framework, I designed a visualization schema that depicted these genres ecologies while also accounting for the multimodal relationships that constellated agents, artifacts, genres, and practices. For example, consider "Figure 5.3: Lt' Lamb's genre ecology" which offers a map of genres, practices, and artifacts included within Lt. Lamb's genre ecology. Located at the center of this genre ecology map is Lt. Lamb. Note that he is surrounded by practices (e.g., monitoring radio, giving commands, monitoring watch, reading smoke, monitoring crews), as well as artifacts (e.g., portable radio, watch, and an accountability board (Figure 5.4: An accountability board) that includes accountability tags for each of the firefighters grouped in two three distinct groups). These tags, for instance, make use of visual and alphanumeric modalities, and work as mediational genres that help Lt. Lamb to manage the cognitive work associated with

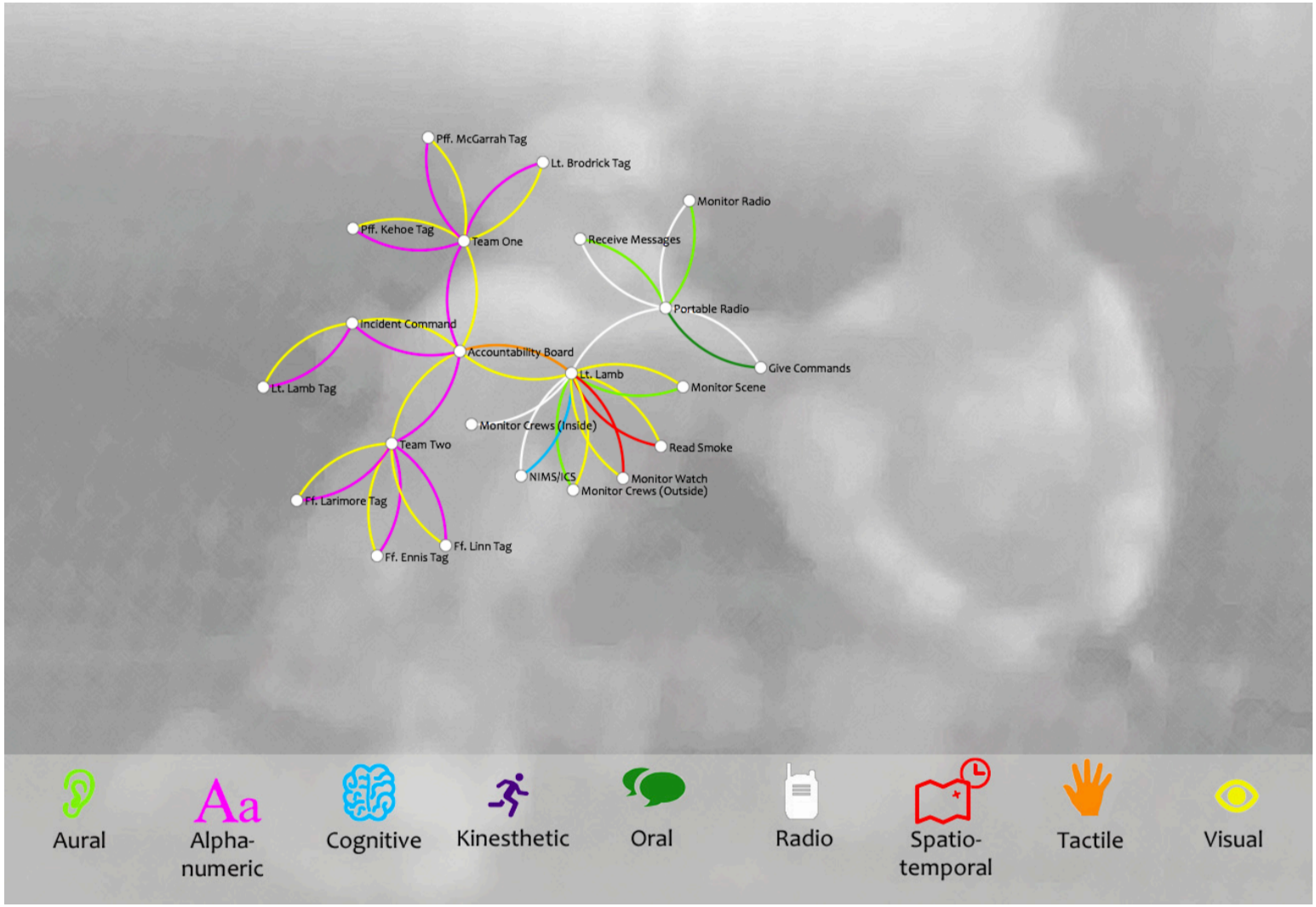

Figure 5.3: Lt. Lamb's genre ecology

Figure 5.4: An accountability board

keeping accountability of the personnel operating on the scene. In order to monitor crews that are present on the board, but not present within his line of sight Lt. Lamb must use the radio. Conversely, for those firefighters outside of the structure within his line of sight, Lt. Lamb can make use of visual and spatio-temporal modalities. Note that from the portable radio artifact we see specific practices that are dependent on this artifact. That is, without this portable radio, Lt. Lamb could not monitor the radio, or give radio commands, or receive radio messages. Also, take note of the fact that radio messages that Lt. Lamb transmitted revealed that he was making use of NIMS/ICS as a cognitive framework for planning and coordinating work activities during this portion of the training exercise. However, what seems most significant is that because Lt. Lamb is

located at a bit of a distance from the scene and outside of the structure, the most predominant modalities in his ecology made use of listening/speaking on the radio messages and visually watching the work, smoke, and crews outside of the structure.

In comparison, I also mapped all of the genres, artifacts, and or agents that were present at a contextual level within the three minute period (Figure 5.5: Environmental genre assemblage). This *environmental genre assemblage* predominantly consisted of written documents that weren't physically present but still exerted a powerful shaping force on the ways that activity on the fireground that evening were conducted. For instance, national standards such *NFPA 1403* is a rigorous standard that outlines how live-fire training evolutions should be organized and carried out. However, aural sounds such as the diesel engine of the apparatus running, the sounds of tool use, radio traffic were in the background, too. While these environmental sounds might seem insignificant, they are important and valuable to the practice of firefighting. For instance, I've been taught—and have used this technique on a number of occasions—that if I get disoriented within a structure, I can use the sound of the engine to help reorient my mental map and/or help me to find my way to an outside wall where I might find a window, a door, or a wall that I could breach to create my own point of egress. And, while I didn't include it in the map, scene lighting can serve a similar visual cue. Again, I've been taught to turn off all of my flash lights and try to see if I can see any flicking lights within the smoke, as they can be used to help find a window or another point of egress. Alone this environmental genre assemblage might not seem significant, but in practice these sounds and sights can be leveraged as components of "reading" practices central to the larger aims of navigating in environments where sensory perception is diminished and/or

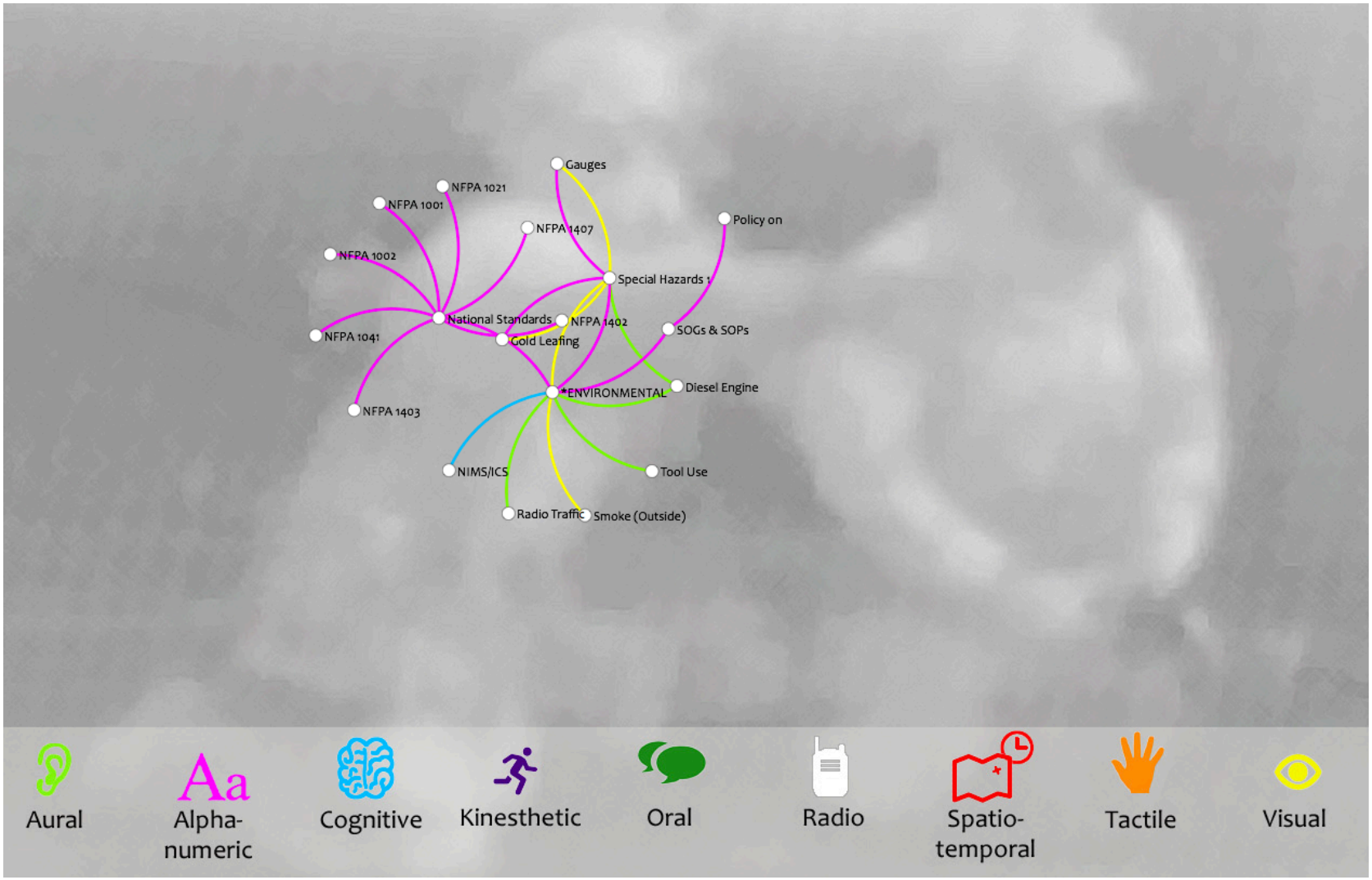

Figure 5.5: Environmental genre assemblage

effecting a self-rescue if firefighters become lost. Similarly, I took stock of the genres, artifacts, components that were present within the *assemblage of worn genres* (Figure 5.6: Worn genre assemblage). Many of the artifacts that I mapped within this assemblage seemed to be components of genre assemblages related to firefighter safety and/or identity. For instance, patches on turnout gear, stickers on helmets, the color and cleanliness of gear and helmets, as well as the different company shields were genres that function as components of larger genre assemblages that firefighters leveraged to construct identity statements about their level of experience, ethos, and positionality within their department's, company's, and/or the fire service at large. However, embedded within these very same artifacts were genres such as warning labels, PASS devices that chirped, alarmed, beeped, blinked, and flashed, as well as the tactile-audible vibra-alert associated with the low-alarm alarm built into the regulatory assembly of the SCBA that were part of larger set of genres specifically dedicated to helping to keep firefighters safe and healthy.

Turning back to the ways these assemblages interrelated within the larger ecologies that team two constructed as firefighters carried out a search, it is clear that tactile, oral, and aural modalities were the predominant means through which knowledge was constructed and communicated by these human agents. Still, there were surrounding assemblages that shaped and correspond to the activity that firefighters carried out. That is, through the practice of firefighting these human agents crossed paths with genres and that had previously been embedded within artifacts circulating within or surrounding the contexts where activity is carried out. For example, as firefighters donned their worn genre assemblage they came in contact with mediational genres like safety warnings

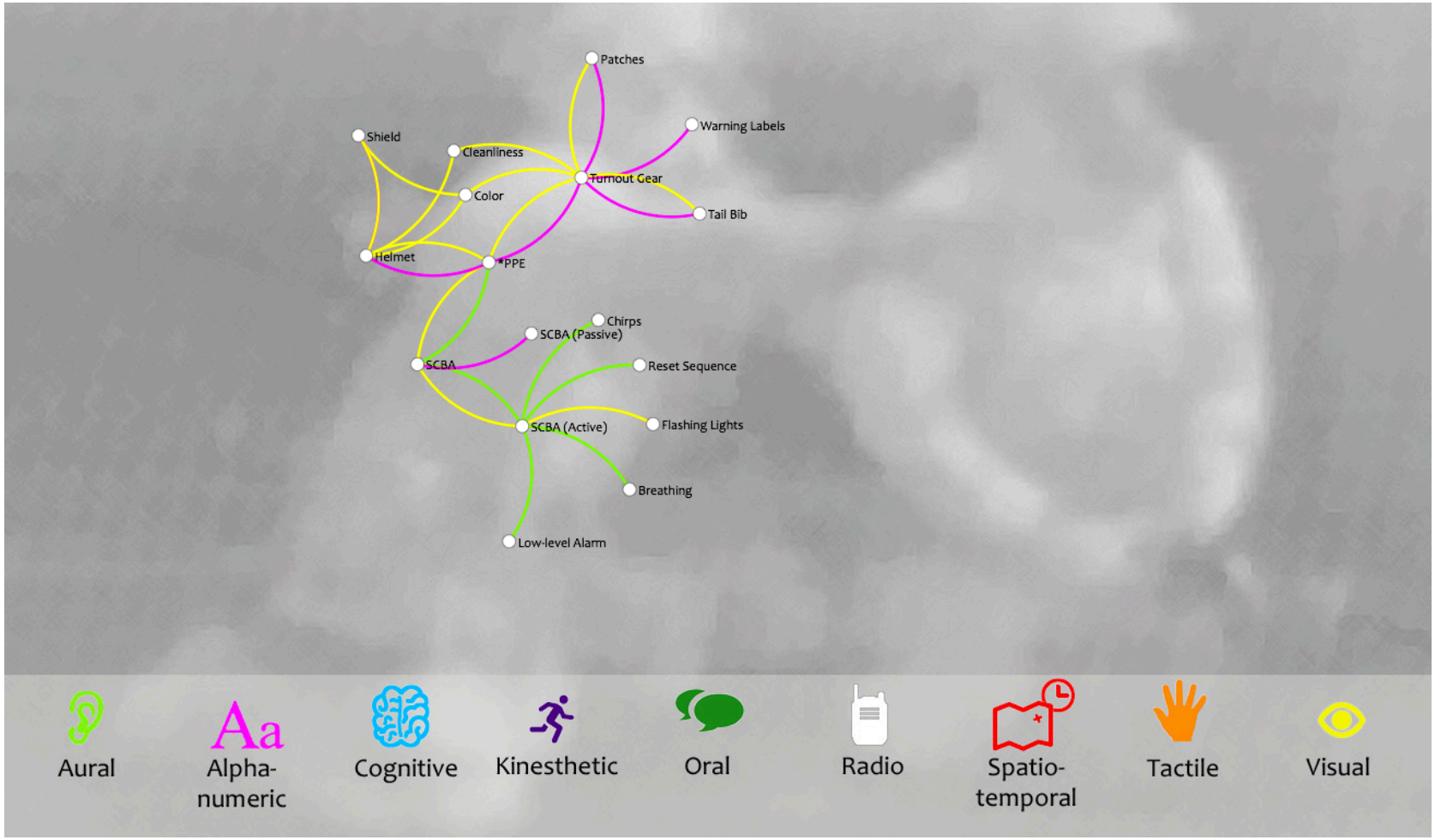

Figure 5.6: Worn genre assemblage

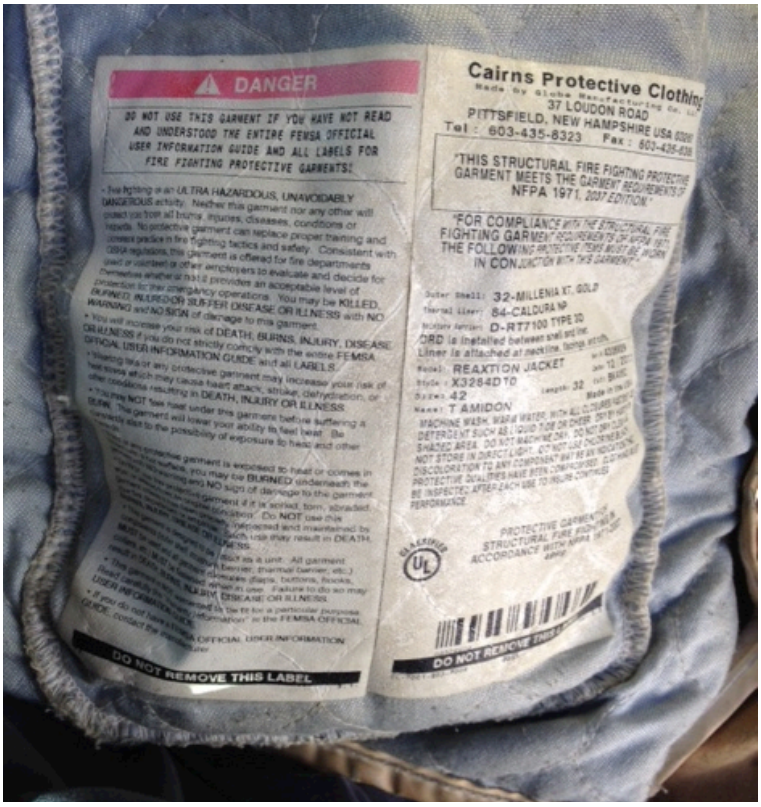

Figure 5.7: A warning label inside a piece of structural firefighting PPE

(Figure 5.7: A warning label inside of a piece of structural firefighting PPE) affixed to the PPE and aural alarms that had been built into SCBA. Through enacting work practices, they situated themselves within a layered larger genre ecology that included the worn genre assemblage and the environmental genre assemblage described above.

What I want to draw specific attention to is the ways that the genre ecologies which each of the different firefighters on team two differed in subtle ways. Team two, who worked inside the structure, made use of physical contact and embodied modalities to communicate with one another and construct knowledge throughout the duration of the evolution. Moreover, even within the team, we can see that different firefighters made use of slightly different ecologies. For instance, Ff. Ennis was the only member of team two that had direct access to the radio. Additionally, like the firefighters in the previous search, Ff. Ennis was solely responsible for maintaining touch with the outside wall, as the team spread out toward the inside of the structure searching the entire floor for the structure. Once Ff. Ennis took contact away from the wall was to briefly search a

"mattress," and then his hand returned directly to the wall. But, the team also used a set of genres that were similar, too. Interestingly, each member of the team was equal in rank, so no member of this team assumed sole leadership for the team. Instead, when Lt. Lamb called the team for status updates, the members stopped and discussed what they wanted Ff. Ennis to say to Lt. Lamb before they resumed the work the were performing. Additionally, each member of the team practiced air management, and constructed knowledge by waving/dragging tools in front of them as they moved navigated throughout the space.

In contrast, Lt. Lamb's (who worked outside of the structure) genre ecology differed significantly and consisted of a divergent set of practices, genres, and aims. For example, whereas Lt. Lamb made use of the accountability board to track the firefighters and monitor the time they had been working exposed to the IDLH environment, firefighters on the crew monitored their SCBA gauges to determine if they had sufficient air left to complete the search. Moreover, whereas the search team predominantly relied on tactile, aural, and oral modalities that traveled through embodied media, Lt. Lamb leveraged a greater range of modalities and media and predominantly relied on visual, alphanumeric, radio based practices in order to keep tabs on the firefighters who were working in an IDLH environment which obstructed visual monitoring. Whereas the team constructed knowledge as a unit, Lt. Lamb acted as an individual synthesized knowledge from a wide array of sources which included the multiple teams operating on the scene, his own visual observations, and the radio reports he received from different teams. As we shift to the next section, I want to draw attention to two specific aspects of this activity that are important to the ensuing discussion: (1) note that only Ff. Ennis carried a

radio, and note that (2) when Lt. Lamb directed messages to team two, the firefighters stopped their activity in order to collectively interpret what that message meant, cobble together the different parts of the message that the firefighters heard, and discuss how they should respond to the IC.

Contradicting integrity: An example of incommensurability between policies, practices, aims, and multi -modality and -media

As portable radios have become increasingly prevalent technology within the fireservice, fireground communications have changed. Before the advent of this technology firefighters communicated with incident commanders by shouting out of windows or incident commanders entered structures in order to conduct face to face conversations with crews operating. Today, all firefighters working within IDLH environments should carry radios in order to call a mayday in the event that they become separated from their team.[33] While a number of fire service leaders whom I greatly respect consider this a criminal act, not all departments provide all firefighters with radios, and some officers believe that non-ranking firefighters should not carry radios because they should not be speaking on the radio. Moreover, the presence of multiple radios in close proximity causes radio feedback when one individual attempts to speak, which is a further barrier to the larger aim of promoting communications across the fire scene. Consequently, firefighters working in crews tend to use one of the following techniques to avoid feedback: (1) only one firefighter on a crew carries a radio; (2) all members of a crew

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[33] According to NFPA 1561 "To enable responders to be notified of an emergency condition or situation when they are assigned to an area designated as immediately dangerous to life or health (IDLH), at least one responder on each crew or company shall be equipped with a portable radio and each responder on the crew or company shall be equipped with either a portable radio or another means of electronic communication" (para. 6. 3. 1).

carry radios, but only one turns his on; (3) firefighters cope with the feedback that at times results in a complete breakdown of communications; (4) one firefighter breaks the physical contact that an interior team uses to maintain unity in order to communicate with command staff outside of the structure. For example, consider how Captain Lynch described how he has adapted to these changes, and in particular note that he describes using the later technique:

> I used to yell out the window all the time. Hey, send me a line; send me a line up the stairwell here. That's how you did it then. Nowaday's it's so easy for me to just get on the radio and say it. But I find myself now, walking into another room to say it, because all my guys are right next to me they all have their portables on and they all have even low but we're so close to each other cause were such a—we're still getting feedback. So, I have to step out of the room, but when my little kids see [their officer] go away they want to protect [him] so they start heading my way. Just cause I'm just gonna tell them can you charge this line. But I got my, they're already coming with me cause they think I'm running away and they want to protect me. I kind of chuckle at some of those things—that ya kinda gotta turn around the corner when they're not looking and get a message out and then go back in again.

What is significant about this account is that Cpt. Lynch confronts a double bind in having to maintain communications with his crew and maintain communications with command staff located outside of the structure. With his crew stays in contact with his crew by maintaining physical, tactile contact, but in order to communicate with IC outside of the structure he has to utilize the radio. Unfortunately, in order to effectively

communicate with IC, he must break communications with his crew, but his crew understands that it's not a safe practice, so they follow him. However, because they follow him, now he has adapted that practice to the point where he purposefully sneaks away from the crew when they don't realize it, so that he can communicate with the IC. In other words, the media through which Cpt. Lynch must realize these dual-aims are incommensurate and compel the leader to decide between remaining in contact with his crew or maintaining contact with the IC. In doing so, Cpt. Lynch is actively admitting that he breaks accordance with *NFPA 1500: Standard on Fire Department Occupational Safety and Health Program* that states "[c]rew members operating in a hazardous area shall be in communication with each other through visual, audible, or physical means or safety guide rope in order to coordinate their activities" (para. 8. 5. 5).

NFPA 1500 is promising from multimodal perspective because it recognizes that firefighters must use a range of modalities in order to effectively communicate and maintain crew integrity in environments which obstruct communications. However, *NFPA 1500* fails to meaningfully respond to co-competing aims associated with the incommensurability of the media through which firefighters must simultaneously maintain crew integrity and effective communications with command staff located outside of the building. That is, if we draw *NFPA 1561* which specifies that all firefighters must carry radios and *NFPA 1500* that species all firefighters must remain in close proximity to one another, it is clear that there is an incommensurability between these standards which firefighters must resolve within practice. The policies may not outline what to do when faced with this double bind, but it is a very real and common occurrence to face: either Cpt. Lynch must break contact with his crew or he must break contact with

IC, because his ways of these co-competing aims position Cpt. Lynch within a genre ecology that involves incommensurate modalities and media.

Ultimately, this example demonstrates the importance of accounting for the interrelationships between policies, practices, and multimodal literacies at a systems level. It is one example, but it is an powerful example because if Cpt. Lynch—like Ff. Ennis—was the only member of a crew carrying a radio, he wouldn't need to break contact with his crew in order to communicate. However, if a crew member became separated from him that firefighter wouldn't be equipped with the capacity to call a mayday. Conversely, because all firefighters on Cpt. Lynch's department carry a radio, he regularly "ducks away" from his crew. In the vignette that opened this chapter, a lieutenant "ducked out" on a crew member, and failed to realize that that a crew member had become separated from him. That firefighter entered an apartment without the protection of a handline, and that firefighter did not go home at the end of the shift. There are not easy answers to these issues, but developing awareness of the co-competing aims and the incommensurability of different genres assemblages seems an important first step if firefighters are going to being to revise these ecologies to address such double-binds.

CHAPTER SIX

Epilogue: A blue-collar techné

One neat thing about growing up in a firehouse is that you spend a lot of time with firefighters. And firefighters tell some pretty magnificent stories about fires. So much do they have to say about their predecessors, old pieces of equipment, byway gone techniques, epic infernos, and moments of both mundane and extraordinary feats of heroism that I'm inclined that the primary function of a firefighter, above all is, is to carry on that heritage through a narrative tradition. So, I'm going to begin this chapter by laying claim to my own identity within that tradition, and I'm going to spin a yarn. Perhaps it's a bit less exciting than the ones I'm more used to hearing within firehouses, but it's mine, and, well, it exemplifies the reason why this research matters. It's a story about *blue collar techné*. It is a story that is about what is at stake when firefighters don't realize that literacies matter to the work that they perform on firegrounds.

Over a decade ago, when I was a much younger man than I am now, there was a fire at a home. The alarm came in during an icy storm on a bitter cold evening in New England. It wasn't a big fire at first, but it became a *huge* fire. When we arrived on scene —I was on the second due engine—and smoke and fire was pouring out of the front of the structure. And I knew that I was going to get to be on the first team to enter the building. It was *my* fire. Stop.

No. That's not right. That's the way most firehouse stories begin. Those are details that really aren't so important to mine. Mine is a different kind of story. It is a story about firefighter literacy. It begins like this. Over a decade ago, at that fire, I probably could have or should have died—twice. Not because what I was doing was dangerous, although

it was. Not because I wasn't trained, because I was. Rather, I should have died twice that night because I didn't understand how to read and write in ways that mattered to me as a firefighter.

I wasn't fluent in the multimodal discourse of the fireservice, and I simply didn't understand that there were ways of reading fire and firegrounds that enable you to make sound strategic and tactical decisions. I couldn't read smoke; I didn't know what I was looking for when we walked around a structure doing a *360*; I didn't know the difference between feeling *hot* and feeling *too hot*; I definitely wasn't given a radio to talk on. I didn't understand that it is a poor tactical decision to search above a fire-floor without a hoseline in a home that we knew was vacant. I definitely didn't read the clues of an impending flashover—although I recall turning to my officer asking, "isn't it a little hot for there to be no fire in here?"; and, I definitely didn't know that attempting to flow a master stream off of an unsecured ladder was a poor idea.

I wanted to know these things. I did; I wanted to be a great firefighter. But, implicitly, I had been taught that I didn't need to know those things. And I had been told that I did not need to know these things because I was not a chief, because I was not a captain, and because I was not a lieutenant. I had been taught to understand my role within the chain of command structure in ways that tracked with a description Captain Keith Gray of Massachaug Fire Department offered:

> firefighters aren't empowered to make decisions with the informed training and things they've gotten. So we've just said, you just be a little mongrel that I tell you what to do—even if that guy is completely capable of being a lieutenant some day or being a decision maker or is an empowered thinker. There are a lot of black

> [hats] out there that have a lot of knowledge that should be [empowered]. [It should be] that on a scene, it doesn't matter what color shield they have—they can bring that knowledge.

Like Cpt. Gray explained, I had been taught that black hats do what they are asked to do, and white hats tell you what to do. Show up and do what you are told: firefighting was that simple. In fact, I was taught that when you're a black hat and you have access to the multimodal discourse of the fireservice that you are a problem—that you are a bad firefighter. I was taught that black hats who don't do what white hats tell them to are wrong. Indeed, I had been taught that those who wear white hats and white shields are responsible for thinking and saying, and firefighters who wear black hats are expected to do, unquestioningly as Tennyson's Light Brigade had: "Theirs not to make reply, / Their not to reason why, / Theirs but to do and die" (Tennyson, 1854, para. 2).

So, I did what I was asked. And, later, when I was less younger, I realized that I had been put into situations—that I had let myself be put into situations—where I could have died simply because I had accepted the way things were, because I had accepted that I didn't need to know, because I trusted people who, as chief officers, should have known that many strategic decisions made that night were poor, and because I had not taken responsibility for my own literacy as a firefighter. As a firefighter who takes great pride in what I do, it is an embarrassing story to tell. But I tell it regularly. And I tell it when I teach at firehouses today, because I believe that black hats not only have a right to know the risks associated with what they might be asked to do, but also have a responsibility to know what those risks are so that they can look out for one another.

What is important about this story isn't that I almost died. What *matters* is that I almost died—or could have died or at least was put in a position where there were significants risks that made little or no strategic sense—because while I may have been a functionally literate firefighter, I was not a critically literate firefighter. I knew how to read and write some of the multimodal discourse on firegrounds, but I didn't know how to read and write using all of the genres. I certainly didn't understand how to use them critically, and above all else didn't understand that genres are rhetorically leveraged on firegrounds to construct and communicate knowledge claims such as what types of work are safe/unsafe, what parameters of risk are acceptable/unacceptable, and what types of strategies will be effective/ineffective, who is allowed/not allowed to use specific genres and tools, and why certain leaders should be trusted/not.

My story, then, says a great deal about the relationship between epistémé and techné that the ancient Greek rhetoricians Plato and Aristotle theorized. Indeed, as Robert Johnson (1998) explained, while each of these rhetorical theorists regarded epistémé—a type of theoretical knowledge—and techné—a craft or art—as categorically distinct, both also "situate[d] techné and any of the arts or crafts associated with technné in an epistemic domain" (p. 51). Johnson, in other words, understood that Plato had drawn an important distinction between the "sham" *art* of rhetoric theorized in *Gorgias*, and the "good" *art* of rhetoric theorized in *Phadreus*. While there is certainly some theoretical slippage between the divisions these ancient Greek theorists drew and that of tripartite literacy theorized by contemporary rhetorical theorist and literacy scholar Stuart Selber (2004), it might be posited that whereas a *functional literacy* resembles a *sham techné*, a *critical literacy* resembles *epistémé*, and finally a *rhetorical literacy* resembles *techné*

utilized in conjunction with *epistémé*. Put simply, we might understand functional literacies as doing without knowing, critical literacies as knowing without doing, and rhetorical literacies are doing while knowing. In short, what concerns me most about my story of literacy is that, as a black hat, I was not simply subjected to, but expected to conform with, a functional version of literacy. That is, as a firefighter, I was understood as labor, in comparison to the chiefs, captains, and lieutenants who, as management, made use of varying degrees of critical and rhetorical literacies. They had access, in other words, to a very different version of *blue collar techné* than I, and my inferior version had "(1) dissociate[d] the labor process from the vested skills and knowledge of workers; (2) seperate[d] conception from execution; and (3) reserve[d] understanding for management [who] use[d] it to control each step of production" (Ohmann, 1985, p. 679).

In this dissertation, my aim was to not only affirm the diversity of literacies by which humans might construct and communicate knowledge by exploring the ways that knowledge travels on firegrounds, but to also attend critically to the ways that firefighters "of different social categories are incorporated into" *a blue collar techné* differentially (Selber, 2004, p. 102). To do so, I sketched the interrelationships among the vast array of aural, oral, kinesthetic, visual, alphabetic, cognitive, and tactile genres that circulates and evolves within embodied, analog, and digital media on firegrounds because I believe that accounting for these interrelationships might enable these firefighters to better understand the ways that genres and media were adopted, interrelated, discarded, and modified as components of literacies that are central to the work that firefighters perform. Again, I understand that "the user of the technology has, through *techné*, the knowledge to overcome the potentially inevitable consequences brought forth by domineering and

determining forces" (Johnson, p. 52). Certainly, firefighters literacies are subject to the "tendential forces" (Johnson Eilola, p. 23) of cultural-historical sedimentation, and many of these practices are assumed as part of a Bordieuian habitus (see Barwarshi & Reiff, 2010, p. 79). But they are also made to be that way through practices that can again be made agentive. Through rending these practices visible—engaging in process of *conscientização* or consciousness raising (Freire, 1970/1990, p. 67)—firefighters might ultimately pursue a *techné* that is humanizing and liberating.

APPENDIX ONE

A list of genres, artifacts, tools, and practices mentioned by Chief Russo

Participant: Chief Stephen Russo, Baytown Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: "360" (visual, kinesthetic; oral, radio); accountability system (visual, textual); ambient noise-chain saws, yelling, pumps (oral, aural); area markings (spatial, visual); attitude (cognitive); architecture-floor plan (visual, architectural); assets (infrastructure); body language (gesture, kinesthetic); boundaries-emotional/physical (cognitive); breathing-composure (kinesthetic, cogntive); budget (textual, economic); checklist-heuristic (cognitive); collar devices-trumpets (symbolic; visual); command post (visual, oral, aural, textual, radio); complaints (oral); computers (visual, alphanumeric, aural, oral, digital); consistent storage in compartments (visual, spatial); construction (architectural; visual, cognitive); conversation (oral, gesture, visual); counseling (oral, visual); dispatch center (oral, aural, infrastructure, digital); dispatch messages (aural, oral); emotional composure (oral); end of service time alarm (tactile, aural); funeral (visual, oral); fire alarm systems (visual, aural, digital); flag (visual, symbolic); incident command system (cognitive, textual); mayday (oral, radio); mutual aid pact (alphanumeric); NFPA standards (textual); observations-crew progression (visual, radio, oral, spatial, temporal); observations-fire progression (visual, spatial, temporal); observations-personnel (visual, radio, oral, kinesthetic); order (radio, oral); organizational meeting (oral, visual); PASS-manual (aural); PASS-integrated (aural, visual, digital); pep-talk (oral, visual); placement of apparatus (spatial, kinesthetic); planning (cognitive); press-interview/video (oral, visual, aural); promotional exam (alphanumeric); pushing/pulling a firefighter to avoid harm (tactile, kinesthetic); radio-800mhz (digital, aural, oral); radio-VHF (analog, aural, oral); radio-communications (digital, analog, oral, aural); radio-intonation (aural, oral); rank (symbolic, visual); reading-objects damaged by fire (visual, space); reading SCBA gauges (visual, alpha-numeric, symbolic, color); reading fire (visual, kinesthetic); reading smoke (visual; kinesthetic; color); reading smoke-backdraft (visual; kinesthetic, color); repeater-building (infrastructure, oral, aural); repeater-general (infrastructure, oral, aural); repeater-vehicle (infrastructure, oral, aural); rhetoric (heuristic, cognitive); roll call (alphnumeric, radio, oral); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-navigation (tactile, cognitive); search-water (spatial, visual, tactile); SCBA (aural); size-up (oral, radio); sign on (radio, oral); space-lost/disoriented (spatial, cognitive, visual); space-trapped (spatial, cognitive, visual); sprinklers (infrastructure, visual, aural); standard operating procedure (alphanumeric); television (visual, aural, oral); training (kinesthetic, oral, visual); uniform (visual); questions (oral); YouTube tutorials (visual, aural, oral, kinesthetic).

APPENDIX TWO

A list of genres, artifacts, tools, and practices mentioned by Chief Burke

Participant: Chief Ron Burke, Coalition Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: "360" (visual, kinesthetic; oral, radio); accountability system (visual, textual); accountability tags (kinesthetic, tactile, visual); architecture/floor plan (visual, architectural); article-training (alpha-numeric); box alarm (aural, oral, radio); black-box (digital); building construction (architectural; visual, cognitive); checking watch (visual, temporal); Christmas card (textual, visual); dashboard-camera (video, visual, digital); data collection and data input (oral, visual, textual); discussion-reflection (oral, cognitive); evacuation-air horns (aural); evacuation-dispatch alert-tones (aural, oral); evacuation-radio (oral, radio); evaluation of radio reports (cognitive); experiential knowledge (cognitive); face-to-face discussion (oral, visual); general alarm (aural, oral, radio); gesture (visual, kinesthetic); grants (text, visual); heads-up display (visual, color, movement); incident command system (cognitive, textual); initial dispatch (oral, aural, radio, analog, digital); interpreting structural integrity (visual, architectural); iPad: pre-plan, notepad, diagrams, database (visual, memory, textual); geography-memory of (spatial; cognitive); monitoring units signing on (oral, radio, analog, digital); monitoring radio traffic (oral, radio, analog, digital); mutual aid pact (text, visual); navigation (visual, tactile, kinesthetic, cognitive); navigation-search (tactile, visual); NFPA 1500 (alpha-numeric); notifications (radio, oral); observations-crew progression (visual, radio, oral, spatial, temporal); observations-fire progression (visual, spatial, temporal); observations-weather (tactile, visual); organizational meeting (oral, visual); PAR (oral, radio); physical movement (visual, kinesthetic); planning (cognitive); proposals (text, visual); pushing/pulling a firefighter to avoid harm (tactile, kinesthetic); radio-communications (digital, analog, oral, aural); radio-intonation (oral, aural, digital, analog); reading SCBA gauges (visual, alpha-numeric, symbolic, color); reading smoke (visual; kinesthetic; color); review process (textual, visual, oral); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sweeping (tactile, kinesthetic); size-up (oral, radio); standing away from collapse zones (spatial, kinesthetic); status reports from arriving units, dispatch, fire, police, EMS (oral, radio, analog, digital); thermal-imaging camera observation (video, visual, digital); thermal-imaging with broadcast assembly, receiver, and monitor (video, visual, digital); tones (aural, radio, analog, digital); typewriter (analog, textual), world-wide-web (digital); yellow pad and pencil (textual, visual, memory).

APPENDIX THREE

A list of genres, artifacts, tools, and practices mentioned by Deputy Chief Kelly

Participant: Deputy Chief Paul Kelly, Coalition Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: "360" (visual, kinesthetic; oral, radio); 911-calls (oral, radio); ad hoc genre-wall as accountability (spatial, kinesthetic); after-incident analysis (oral); accountability system (visual, textual); architecture-floor plan (visual, architectural); body-language (visual, kinesthetic); budget (alpha-numeric); calming-face-to-face discussion (oral); command post (visual, oral, aural, textual, radio); critical-incident stress debriefing (oral); diagraming (textual, drawing, symbolic); evacuation-air horns (aural); evacuation-radio (oral, radio); evacuation-dispatch alert-tones (aural, oral); evaluation of radio reports (cognitive); experiential knowledge (cognitive); fire academy (infrastructure); gesture (visual, kinesthetic); incident action plan (oral, textual, cognitive); incident command system (cognitive, textual); initial dispatch (oral, radio, analog, digital); monitoring units signing on (oral, radio, analog, digital); monitoring radio traffic (oral, radio, analog, digital); NFPA standards (textual); observations-crew progression (visual, radio, oral, spatial, temporal); observations-fire progression (visual, spatial, temporal); on-scene interview (oral, visual); operational budget (textual, economic); order (radio, oral); organizational meeting (oral, visual); phone-calls (oral, analog, digital); physical movement (visual, kinesthetic); placement of apparatus (spatial, kinesthetic); planning (cognitive); radio-communications (digital, analog, oral, aural); radio-intonation (oral, aural, digital, analog); reading smoke (visual; kinesthetic; color); [RECEO-VS] (cognitive, heuristic, mnemonic); search-calling out (oral); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-navigation (tactile, cognitive); search-sweeping (tactile, kinesthetic); second alarm (oral, radio); skip breathe-listening (kinesthetic, aural); status reports from arriving units, dispatch, police, EMS (oral, radio, analog, digital); tones (aural, radio, analog, digital); training facilities (space, infrastructure).

APPENDIX FOUR

A list of genres, artifacts, tools, and practices mentioned by Captain Gray

Participant: Captain Keith Gray, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: application (alphanumeric); black shield (visual, alphanumeric); by laws (alphanumeric); box alarm (aural, oral, radio); companies (symbolic); committee meeting-training (visual, oral, spatial); complaints-in house (oral); duty board (visual, alphanumeric); fire academy (infrastructure); fire alarm panel (visual, aural); elections (oral, alphanumeric); experiential knowledge (cognitive); incident command system (cognitive, textual); inspections (visual, tactile); ISO ratings (alphanumeric, symbolic); jurisdiction (spatial, geographic); paycheck (alphanumeric); PPE-color (visual); press-interview/video (oral, visual, aural); probation (temporal, symbolic); rank (symbolic, visual); resignation letters (alphanumeric); riding position (spatial); standard operating procedures (oral, alpha-numeric); stereotypes (symbolic); training requirements (alphanumeric); transfer of command (oral, radio); t-shirt (visual, alphanumeric).

APPENDIX FIVE

A list of genres, artifacts, tools, and practices mentioned by Captain Lynch

Participant: Captain Robert Lynch, Millwick Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: "360" (visual, kinesthetic; oral, radio); "10-4" (oral, radio); "10-26" (oral, radio); 6th sense (multimodal); air monitoring (digital); alert-button (aural, radio); architecture/floor plan (visual, architectural); *Backdraft* (visual, aural, oral, film); building construction (architectural; visual); cell-phone/recording (aural; oral; digital); cigarettes (visual); code red (oral; radio); cold smoke (visual, kinesthetic); debrief (oral); dispatch (aural, oral); earlobes (tactile); emotional composure (oral); *Fire Officer's Handbook of Tactics* (alpha-numeric); feedback (aural; radio); geography-memory of (spatial; cognitive); gesture (kinesthetic, visual); gum chewing (kinesthetic; tactile); grab-forcefulness (tactile); hot smoke (visual, kinesthetic); hug (tactile); IFSTA manuals (alpha-numeric, symbol, visual); incident command system (cognitive, textual); initial dispatch (oral, radio, analog, digital); interpreting integrity of structure (visual, architectural); joke (oral, intonation); log-book (alpha-numeric); monitoring radio traffic (oral, radio, analog, digital); knocking-trapped (aural, tactile); low air alarm (aural); mayday (oral, radio); navigation-search (tactile, cognitive); observations-fire progression (visual, spatial, temporal); odor-smoke (smell); planning (cognitive); planning-crew assignment (oral); preparation-conversations (oral); protocols (oral, text); radio-communications (digital, analog, oral, aural); radio-800mhz (aural, oral, digital); radio-intonation (oral, aural, digital, analog); radio-intonation screaming (oral, aural, digital, analog); radio-repeater (radio); radio-VHF (aural, oral, analog); reading smoke (visual; kinesthetic; color); riding position-back step (spatial); "telephone"-relay (oral); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sight (visual); search-status update (oral, radio); search-sweeping (tactile, kinesthetic); search-talk (oral); SCBA mask (aural); size-up (oral, radio); six-sigma (heuristic, cognitive); standard operating procedures (oral, alpha-numeric); statistics-runs (alpha-numeric); status reports from arriving units, dispatch, police, EMS (oral, radio, analog, digital); tapping-hand (tactile, kinesthetic); thermal imaging camera (visual, digital); tones (aural, radio, analog, digital); questions (oral); Q-siren (aural); white out (visual, digital); yanks-rope (alpha-numeric, tactile, kinesthetic).

APPENDIX SIX

A list of genres, artifacts, tools, and practices mentioned by Lieutenant O'Rourke

Participant: Lieutenant Sam O'Rourke, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: architecture/floor plan (visual, architectural); box alarm (aural, oral, radio); "code red" (oral, radio); construction (architectural; visual); conversation (oral, gesture, visual); discussion-fire attack (oral, gestural); diagnosis-medical (visual, oral, tactile); funeral (multiple); gallows humor (orality); geography-memory of (spatial; cognitive); geography-memory of (spatial; cognitive); gesture (kinesthetic, visual); heat (tactile); incident command system (cognitive, textual); initial dispatch (oral, aural, radio, analog, digital); listening to other departments communications (oral, radio); map (alphanumeric, visual); mutual aid pact (alphanumeric); narrative-tradition (oral); observations-fire behavior (visual, spatial, temporal); observations-fire progression (visual, spatial, temporal); observations-weather (tactile, visual); preparation-conversations (oral); press-interview/video (oral, visual, aural); radio checks (oral, radio); radio-priority message (oral, radio); radio-intonation screaming (oral, aural, digital, analog); radio-profanity (oral, aural, radio); rank (symbolic, visual); reading fire (visual; kinesthetic; color); reading smoke (visual; kinesthetic; color); riding position (spatial); safety violation (multiple); size-up (oral, radio); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sight (visual); search-status update (oral, radio); search-sweeping (tactile, kinesthetic); search-talk (oral); status report (oral, radio, analog, digital); standard operating procedures (oral, alpha-numeric); symptoms (visual, oral, tactile); time (temporality); training (kinesthetic, oral, visual); transfer of command (oral, radio); tones (aural, radio, analog, digital); tone test (aural, radio, analog, digital); yelling (oral, aural); water on the fire (aural);

APPENDIX SEVEN

A list of genres, artifacts, tools, and practices mentioned by Lieutenant Maynard

Participant: Lieutenant Joe Maynard, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: "360" (visual, kinesthetic; oral, radio); accountability system (visual, textual); accountability tags (kinesthetic, tactile, visual); architecture/floor plan (visual, architectural); assignments (oral, alphanumeric); bells (aural); black shield (visual, alphanumeric); box alarm (aural, oral, radio); "code red" (oral, radio); collar devices-bars (symbolic; visual); company patches (visual, alphanumeric); complaints-in house (oral); conversation (oral, gesture, visual); discussion-fire attack (oral, gestural); discipline (oral); evacuation-air horns (aural); evacuation-dispatch alert-tones (aural, oral); evacuation-radio (oral, radio); funeral (multiple); gallows humor (orality); geography-memory of (spatial; cognitive); gesture (kinesthetic, visual); initial dispatch (oral, aural, radio, analog, digital); insurance policy (alphanumeric); joke (oral, intonation); jurisdiction (spatial, geographic); mutual aid pact (alphanumeric); observations-fire behavior (visual, spatial, temporal); observations-fire progression (visual, spatial, temporal); observations-weather (tactile, visual); odor-smoke (smell); order (radio, oral); PPE (visual, color); PPE-helmet (cleanliness, color); pushing/pulling a firefighter to direct (tactile, kinesthetic); radio-acknowledgement (radio, oral) radio checks (oral, radio); radio-intonation screaming (oral, aural, digital, analog); radio-priority message (oral, radio); radio-profanity (oral, aural, radio); rank (symbolic, visual); reading smoke (visual; kinesthetic; color); riding position (spatial); search-sweeping (tactile, kinesthetic); safety violation (multiple); search-talk (oral); search-tapping (tactile, kinesthetic); screaming (oral, aural, digital, analog); sign (visual, alphanumeric); size-up (oral, radio); standard operating procedures (oral, alpha-numeric); status report (oral, radio, analog, digital); tapping-hand (tactile, kinesthetic); tapping-tool/sounding the floor (tactile, kinesthetic); thermal imaging camera (visual, digital); thermal imaging camera-painting (visual, digital, kinesthetic); tones (aural, radio, analog, digital); tone test (aural, radio, analog, digital); uniforms (visual).

APPENDIX EIGHT

A list of genres, artifacts, tools, and practices mentioned by Private Smith

Participant: Private Stanley Smith, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: body language (visual, kinesthetic); "code red" (oral, radio); diagnosis-medical (visual, oral, tactile); emotional composure (oral); gesture (kinesthetic, visual); inspections (visual, tactile); narrative-tradition (oral); joke (oral, intonation); observations-weather (tactile, visual); radio checks (oral, radio); radio communications (oral, aural, digital, analog); radio-intonation (oral, aural, digital, analog); size-up (oral, radio); symptoms (visual, oral, tactile); training (kinesthetic, oral, visual); yelling (oral, aural).

APPENDIX NINE

A list of genres, artifacts, tools, and practices mentioned by Private Jordan

Participant: Private William Jordan, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: accountability system (visual, textual); accountability tags (kinesthetic, tactile, visual); application (alphanumeric); architecture/floor plan (visual, architectural);"code red" (oral, radio); construction (architectural; visual) diagram (visual); fire alarm panel (visual, aural); evacuation-air horns (aural); evacuation-dispatch alert-tones (aural, oral); evacuation-radio (oral, radio); gallows humor (orality); gesture (kinesthetic, visual); initial dispatch (oral, aural, radio, analog, digital); joke (oral, intonation); observations-fire behavior (visual, spatial, temporal); observations-fire progression (visual, spatial, temporal); observations-weather (tactile, visual) ; radio checks (oral, radio); radio-profanity (oral, aural, radio); reading fire (visual; kinesthetic; color); reading smoke (visual; kinesthetic; color); riding position (spatial); safety violation (multiple); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sight (visual); search-status update (oral, radio); search-sweeping (tactile, kinesthetic); search-talk (oral); status report (oral, radio, analog, digital); size-up (oral, radio); tones (aural, radio, analog, digital); water on the fire (aural); written review (alphanumeric).

APPENDIX TEN

A list of genres, artifacts, tools, and practices mentioned by Private Crawford

Participant: Private James Crawford, Massachaug Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: architecture/floor plan (visual, architectural); construction (architectural; visual); evacuation-air horns (aural); evacuation-dispatch alert-tones (aural, oral); evacuation-radio (oral, radio); gallows humor (orality); geography-memory of (spatial; cognitive); observations-fire progression (visual, spatial, temporal); radio communications (oral, aural, digital, analog); radio-priority message (oral, radio); reading smoke (visual; kinesthetic; color); run cards (radio, alphanumeric); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sight (visual); search-status update (oral, radio); search-sweeping (tactile, kinesthetic); search-talk (oral); size-up (oral, radio); standard operating procedures (oral, alpha-numeric); training (kinesthetic, oral, visual).

APPENDIX ELEVEN

A list of genres, artifacts, tools, and practices mentioned by Private Prior

Participant: Private Vincent Prior, Millwick Fire Department
Genres, Artifacts, Tools, and/or Practices Mentioned: ad-hoc genre, mantra (oral); architecture/floor plan (visual, architectural); *Backdraft* (visual, aural, oral, film); blood pressure (visual, alphanumeric); body language (visual, kinesthetic); construction (architectural; visual); cell-phone/recording (aural; oral; digital); diagnosis-medical (visual, oral, tactile); ear lobes (tactile); emergency lights (visual, kinesthetic); emotional composure (oral); experiential knowledge (cognitive); heat (tactile); hug (tactile); geography-memory of (spatial; cognitive); gesture (kinesthetic, visual); incident command system (cognitive, textual); inspections (visual, tactile); joke-calming (oral, intonation); PPE (cleanliness, visual); observations-fire progression (visual, spatial, temporal); odor-smoke (smell); preparation-conversations (oral); preplans (cognitive, geographic, architectural, visual); protocols (oral, text); question (oral) radio-intonation-screaming (oral, aural, digital, analog); radio communications (oral, aural, digital, analog); radio-800mhz (aural, oral, digital); radio-intonation (oral, aural, digital, analog); radio-intonation screaming (oral, aural, digital, analog); radio-volume (aural, oral); reading smoke (visual; kinesthetic; color); SCBA mask (aural); size-up (oral, radio); search-listening (aural); search patterns (tactile, kinesthetic, oral, aural, visual, spatial); search-sight (visual); search-status update (oral, radio); search-sweeping (tactile, kinesthetic); search-talk (oral); search-waypoints (spatial, tactile); symptoms (visual, oral, tactile); tag lines (tactile, spatial); thermal imaging camera (visual, digital); walkthroughs (architectural, visual, kinesthetic); whiteout (visual, digital);

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